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RAY AND PLIN

ON A JOURNEY TO DISCOVER
A FANTASTIC WORLD

achabgroup



For my dad.





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Ray and Plin on a journey to discover a fantastic world

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RAY AND PLIN

ON A JOURNEY TO DISCOVER
A FANTASTIC WORLD

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Illustrations: Monica Alletto





RAY AND PLIN

Ray was a little photon. No smaller than other photons because photons are really tiny. He had left the Sun and had arrived on Earth in just over eight minutes, at the speed of light. While Ray was travelling from the sun to the earth, Plin was in the school yard leisurely minding his own business. Ray touched Plin's forehead, brushing it softly like only he could do. Plin gazed at him and Ray was amazed; it was the first time in billions of years that someone had looked at him.

He introduced himself: "Hello, I'm Ray – I'm a photon, I come from the sun and I can be both a wave and a particle, in a way that not even scientists can make out. Who are you?"

"Hello" replied Plin, "I'm nine years old, I go to school and I like listening and asking questions".

Ray had never been so happy; nobody had spoken to him since the beginning of the Universe. It felt amazing.

"You know Plin, I was born at the same time as the Universe. Before me there were only void and darkness. It was so dark you couldn't see a thing because light still hadn't been created. The darkness lasted for a time so long that it couldn't be measured. Then, a Big Bang created the Universe and I was born.

Plin turned his back to the sun and asked Ray the first of a long series of questions: "You're old. much older than me: do you do silly things too?"



THE BEGINNING OF EVERYTHING

“Plin, I don’t know what ‘silly things’ are, but I can travel at the speed of light, no slower and no faster”.

“Cool”, said Plin, “the speed of light is brilliant! I could stay in bed until the last second and still get to school before registration, faster than a Formula 1 Ferrari”.

Ray didn’t know what a Formula 1 Ferrari was, but he liked the way Plin had said ‘cool’ and felt proud. It was the first time he had been called ‘cool’ and ‘brilliant’.

Plin became thoughtful: “You must have seen so many things travelling around at that speed! You must have learned so much! You must have so many stories to tell me!”

Ray didn’t need to be asked twice: “In the beginning, we were all the same. It was hot, really hot, and we were squeezed tightly together. Then two particles crashed into one another in a single zone, an extremely rare event, like winning the lottery, and a few atoms started to aggregate, like a snowball that rolls and grows bigger and bigger. But instead of a snowball, the first stars lit up with sudden explosions, launching matter into space. We are all made of stardust, even you too Plin!”

Plin smiled, he really liked the idea that he was made of stardust. Then he thought of his 15 year-old sister. If she found out she was made of stardust, there’d be no stopping her. Better keep it a secret!

STARDUST

Plin asked: “stardust? I’ve never seen stardust; I do have lots of dust in the attic though. Tell me more!”

“You see Plin, stars are born when matter comes together. Different stars launch different matter into space. And the matter they send into space breaks apart. Then it meets other stars or planets and comes together again - like snowballs - and other matter is formed.

Plin gave him a puzzled look: “You mean stars are like a factory?”

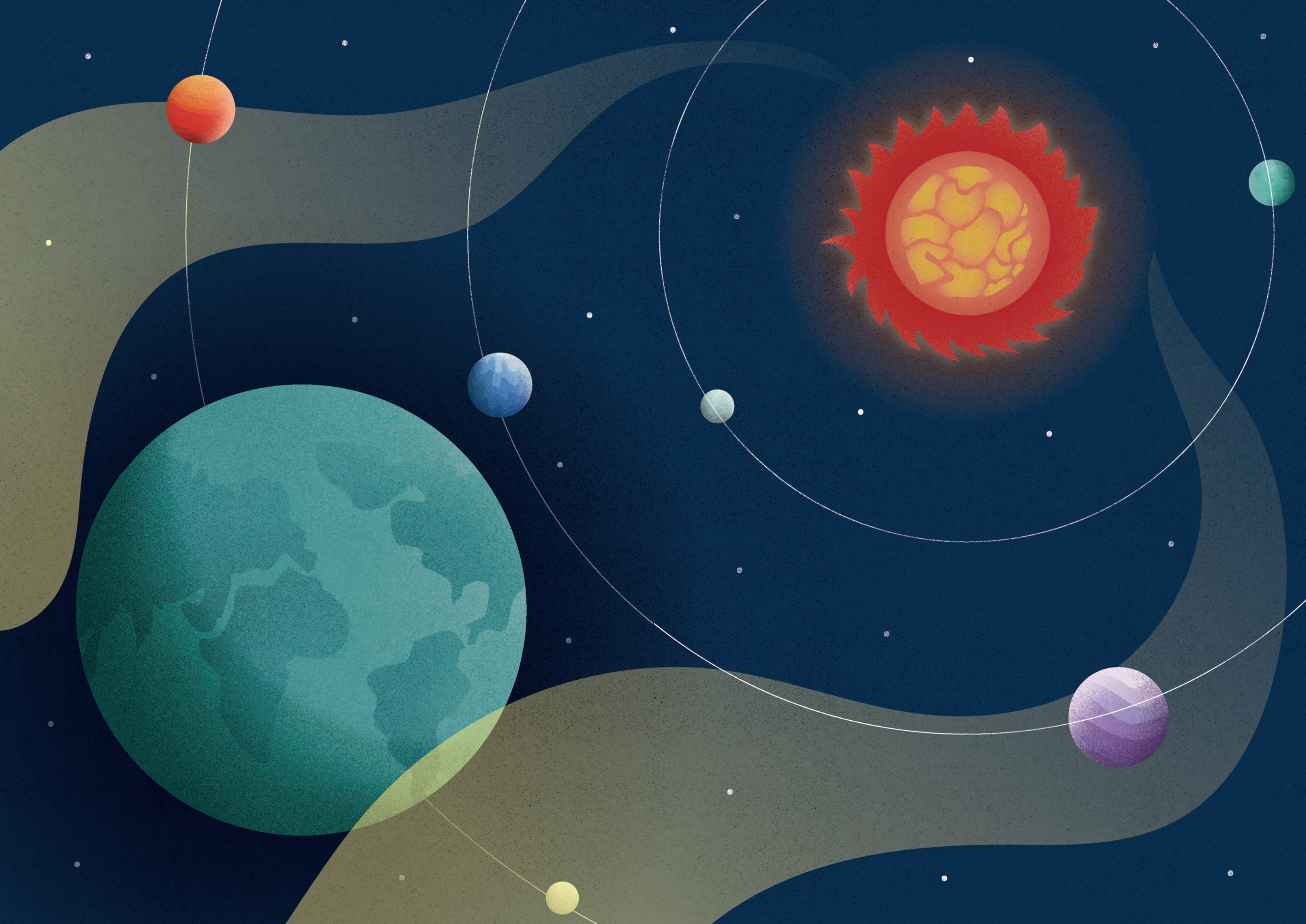
Ray tried to give him an example: “If you want to make a cake, you mix some ingredients and then put it in the oven”. Plin loved cakes and he nodded keenly. “The same happens for stars. There are billions and billions of them and they have been shining for so many years they’ve had time to make zillions of different cakes. When the cakes are all burnt out they explode and all the ingredients spread out all over the universe”.

Plin jumped up: “One of my mum’s cakes exploded once. The lid of the mixer blew off and all the ingredients ended up all over the kitchen, on the cupboards, the walls and the ceiling. Mum wasn’t happy and dad was even less happy than mum”.

“Exactly! Just like your mum’s cake, the elements produced by the stars spread out into the universe and into planets like Mars, Venus and the Earth. Even the Earth, in the beginning, was cosmic dust rotating around the sun. Then, little by little, it started to join with other dust, rocks and metals. The more it grew, the more matter it attracted, growing bigger and bigger, and planet Earth started taking shape, at the right distance from the Sun, so it wouldn’t be too hot or too cold”.

“Lucky for us”, said Plin, “I wouldn’t like to live on a planet covered in ice”.

“Or boiling hot and covered in molten lava”, added Ray.



AT THE SPEED OF LIGHT

Plin asked: “If you’ve been travelling in space for so long, how many planets have you seen?”

“Too many to count”, answered Ray “Lots and lots, but none like yours. Seen from space, your planet is beautiful; blue and white. And when you see it up close, it’s even more beautiful; green, yellow, red and a thousand more colours. It’s covered with life in so many different forms. It must be wonderful to live on Earth, you humans must feel really at home here. Have you already seen it all?”

“I wish!” exclaimed Plin. “I’ve only seen the leaning tower of Pisa and a park near here with ducks and swans”.

Ray became thoughtful; you could see his spin particles whirling while he was thinking. He had an idea, but he wasn’t sure it was a very good one. Plin, who wasn’t stupid, had realized something was up and was keeping very quiet, asking no questions. Finally, Ray made up his mind. If he had had shoulders, he would have shrugged them, as if to say, “what will be will be”, but he didn’t have shoulders, so he just stopped his spins from swirling and made a suggestion: “How would you like to take a trip with me up and down the Earth? Just to see what it looks like, how beautiful it is, and what happens in the world?”

Plin yelled “Yeeees!!!” - It definitely didn’t take him long to decide. But then he checked the time on his phone and said “But I have to be home for lunch, how shall we manage?”

“Easy” – said Ray – “you can just travel with me at the speed of light – don’t worry about how... have you ever heard of quantum entanglement?”

“I’ve never heard of “entanglement”, but Quantum, yes, it’s a TV show, isn’t it?”

“Never mind, forget I said it, but trust me, we can go for a journey around the Earth, at the speed of light. We’ll be back before evening, what do you say, are you coming?”





MUM

“Ray, I should call my mum, what will I say, should I make up a little lie, like I’m going to a friend’s for lunch?”

“I can’t help you Plin, I don’t know what a mum is or what a little lie is either...”

Plin thought about it. What could he do? Perhaps the best thing would be to tell the truth, maybe she would let him go. He plucked up all his courage and called his mum on his phone.

“Hello darling, is everything all right?” Mum sounded a little apprehensive: if he called there always had to be a problem.

“Everything’s fine mum, I only wanted to ask if, instead of coming home for lunch, I can go out with a friend of mine”.

Mum replied in a more relaxed tone of voice: “A school friend”? Technically no – thought Plin – but also yes, they were still in the school grounds and Ray was his new friend. “Yes” – he replied – “With Ray”.

“And where are you going?” – asked his mum. This was harder – thought Plin, but he remained firm in his decision to tell the truth: “We are going round the world, but I’ll be home for dinner”.

“For a research project?” – asked mum.

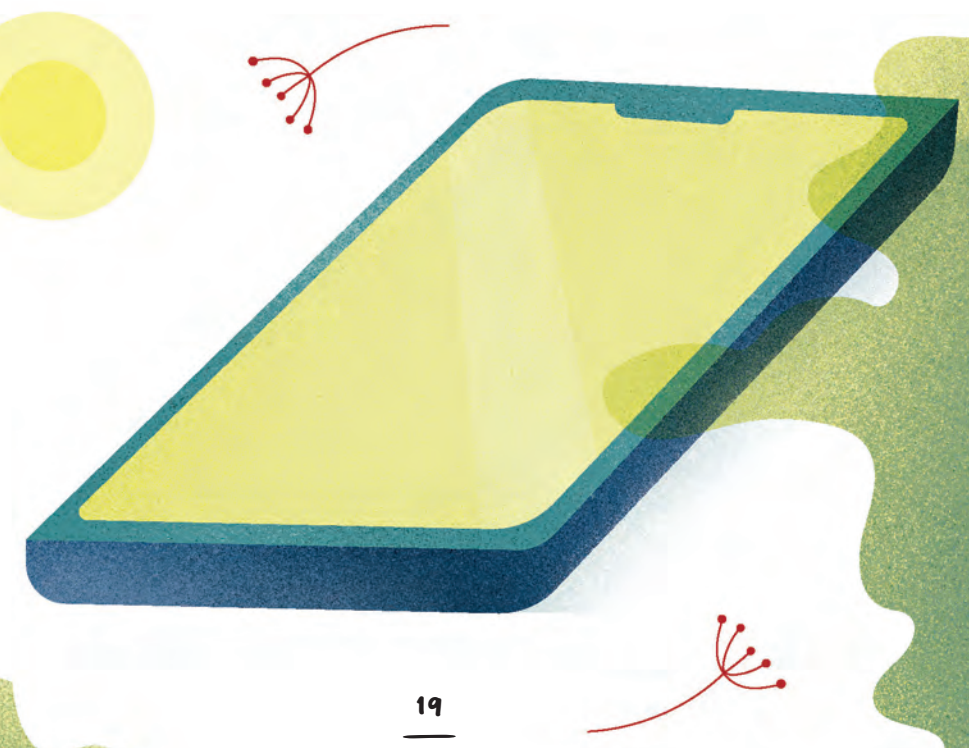
A research project? Of course, Ray was going to take him to discover the secrets of life on Earth. “Yes, we want to finish some research on the Earth today”.

The seconds were ticking by. Time was indeed relative, sometimes seconds were very long, so slow that it seemed that they would never pass, and other times they vanished in a flash, who knows where.

“Ok, ok, actually I have a lot to do and, if you aren’t coming home for lunch, I’ll leave for the office now, but don’t switch off your phone in case I need to call you”.

“Yes mum, will do, bye”.

It was done. Telling the truth is always the best policy. He wasn’t sure mum had understood fully, but he had told the truth. He turned to Ray and cried: “Hurray, let’s go on a tour of a fantastic world!”





THE NORTH POLE

Plin had never travelled this way before. In less than the blink of an eye, in no time at all, he found himself at the North Pole. He looked around slowly: ice, wind, snow and only two colours, the bright blue of the sky and whitest white of the frozen snow. But he wasn't cold and he didn't even wonder why. There was no point asking questions about things he couldn't understand.

Ray was smiling. He could see on Plin's face the same amazement he felt after the Big Bang, when he had gone from feeling nothing to travelling incredibly fast, at the speed of light, up and down the Universe. Ah, the good old days, when everything was new, everything was surprising, everything was fantastic! Then, after a few billion years, things had become a little bit repetitive, but he still enjoyed surprises and now he was happy because he saw all the wonder of his first discoveries in Plin's eyes.

The expanse of ice seemed infinite.

"Hey Ray" – Pin asked – "How much ice is there?"

"26 million cubic metres to be precise; water can be found on Earth in three states: liquid, gaseous and solid. It passes from one state to the other depending on temperature. It is solid below zero and liquid up to 99°C. Above that it boils, becomes gaseous and evaporates".

"Like when mum cooks pasta?"

"That's right, it spreads in the air, aggregates and forms clouds, then it cools down and falls to the ground as rain, snow or hail".

"Dad doesn't like hailstones; he says they ruins his car; once lots of enormous hailstones came down as broke his windshield. Dad was very angry; he didn't know who to blame. Then he started saying it was Arthur's fault, but I don't know anyone called Arthur...".

Plin thought of his dad being angry if he found out he had gone to the North Pole. Maybe he could try blaming Arthur too. It wasn't cold. In actual fact it was warm, like 600 million years ago, when all the glaciers had melted quickly due to a volcanic eruption. Plin noticed and asked: "How come it's not cold? All the polar explorers I've seen on TV were always wrapped in big coats but today it's really warm".

Ray drew a deep spin-breath. "Greenhouse effect, too much CO₂ in the atmosphere. Every time you use energy made from fossil sources such as coal, oil and gas it releases CO₂ which is dispersed in the air".

"Like water when it evaporates?"

"Yes, the CO₂ trapped in oil, accumulated over billions - or rather hundreds of billions of years, is released within just a few decades and dispersed into the air".

"How come it doesn't rain CO₂?"

"Because it spreads in the sky and forms a film which traps the Earth's warmth. The thicker the film the more heat is trapped and..."

A sudden noise made them turn towards the edge of the ice. A long crack was spreading faster and faster, zigzagging like a snake hunting an invisible prey. The noise was the sum of countless creaks mixed with moans and screeches. Then there was a moment of silence, as if the whole world had stopped, holding its breath. Finally, an enormous piece of polar ice - bigger than an island - broke away, remaining suspended in the air as if it were weightless, reflecting millions of different shades of blue. Then it was as if a bomb had exploded and the ice island plummeted down into the arctic sea, shifting an enormous mass of water and bobbing up and down like a roller coaster. Plin liked roller coasters, even if they made him feel sea-sick, or maybe because of it. But as a cloud of water and snow settled down all around them, he realised that the ice world was melting, disappearing, maybe forever.

"Ray, where does all this ice go?"



"Plin, do you know the theory of communicating vessels?"

Plin frowned, he had heard of communicating vessels: "If you connect two vessels with a string you can shout into one and be heard in the other? Ehm no, that was with two jars. Perhaps you mean communicating cell phones? Mum always speaks into hers; she uses voice messages in WhatsApp and other mums reply. They are communicating mums! As soon as one of them finds out something new, she sends a voice message on WhatsApp and all the others know it too".

Ray laughed. "It's more or less the same. Water does the same as your mum does with news; as soon as there's new water it spreads around evenly and raises the sea level all over the planet".

Plin looked at Ray doubtfully: "I don't know why, but that doesn't seem to be a good thing".

"If you live on an island at sea level or on the coast and the sea level rises, what can you do?" – asked Ray.

"Take off my socks and shoes and roll up my trousers?" –replied Plin.

"I wish that was enough, everything would be simpler, but unfortunately it doesn't work like that".





THE ISLAND THAT'S NO LONGER THERE

Ray took Plin by the hand. Plin felt a pleasantly warm sensation, looked at the little light on his hand and smiled. Then he looked up and began observing his surroundings. It was getting hot, very, very hot: the sun was shining and all around there was nothing but ocean, an infinite expanse of saltwater reflecting the sunlight like billions of mirrors.

Plin squinted till his eyes became a thin slit, brought his hand to his forehead to shield them and looked around. Water, water, only water. Then he looked down at his feet. They were on an island so small that it was hardly there. He could only take two steps forward and two steps back, then the island was finished. But it continued under the water: two, three or four inches below the water's surface, no more. Here and there, the water lapped against an emerging tree trunk or a rock, making a sound that was always the same and always different, as if the waves were endlessly chasing each other.

Pin looked at Ray and asked: "Where are we?"

"This was the island of Nuatambu in the archipelago of the Solomon Islands in the Pacific Ocean. There was a small village here but the sea level has risen by 15 centimetres over in the last 20 years. Not enough to wet the bottom of your trousers, but those who lived here had to leave".

Plin was sad; it must've been awful having to leave, knowing you couldn't come back. To leave forever because your home no longer exists, submerged by the sea, little by little, 7.5 millimetres a year.

"This isn't the only island that's not there" – Ray went on – "Many more will be submerged and disappear forever".

Plin began to walk in the shallow water towards the open sea, his feet sinking lightly in the sand. They walked for several minutes; the water was warm, light blue, slowly getting deeper, up to his knees. When he reached the edge of the old island, the water in front of him suddenly changed colour, becoming a deep and inviting blue. Plin didn't think twice and dived in.



He had never swum before, but that day he was doing all kinds of things he'd never done before. He found himself among lots and lots of fish of different shapes and colours: with stripes, dots, flat ones, wide or thin, swimming this way and that, as if there was nowhere specific to go but also as if they all knew where they were going. It was beautiful. He saw a coral reef in front of him. It was like being inside a National Geographic documentary. Only, in place of the camera there was him.

He heard Ray's voice - it was strange to speak underwater, but with Ray everything was strange and possible at the same time: "Can you see the coral reef?"

Plin looked up: before him a barrier made of coral stretched upwards.

"Nice" – exclaimed Plin- "It looks like a forest of small stone trees, full of fish swirling around it".

"Actually they are polyps, tiny marine invertebrates; they live in huge colonies and are among the longest-living creatures on Earth. They can be thousands of years old. They build an outer skeleton using photosynthesis and producing calcium carbonate; they need to be just under the sea's surface and, as the seabed sinks gradually deeper and deeper, they grow, in order to seek the light and feed on the micro-algae that circulate in the water. But if the sea level rises too quickly, they find themselves in the dark and starve to death".

Plin looked again: part of the coral reef was white, lifeless, like a ghost forest swathed in fog, but underwater.

"Atolls are formed thanks to the coral reefs and are one of the places richest in life on the planet".

Plin hadn't quite understood everything but he guessed there must be a link between rising temperatures, melting ice, disappearing islands and dying coral. Like that time he had gone home with dirty shoes and gone up to his room without taking them off. He had heard his mum shouting his name because she knew that there must be a very close link between the dirt, the shoes and him.

"Ray, I don't like islands that aren't there anymore".

"I know Plin, beautiful things leave a great emptiness when they're gone. It's much better when it's the ugly things that end".

Plin smiled, he could never stay sad for more than a few minutes. "Ray, you said something silly: everybody knows that beautiful things are better than ugly ones".

"So why do humans carry on doing ugly things?" – asked Ray. The question hovered there without an answer, deep in the sea, then started to rise very slowly, paused for a moment under the surface of the water and then, with a final effort, broke free into the air.

Plin observed it and couldn't help wondering how many questions without an answer must be floating up and down in the Earth's atmosphere. He turned to Ray and asked: "Ray, all the answers gone? The world is full of questions, but where are the answers?"

"Plin, you have to look for answers, especially those that are hard to find".

"That may be so, but I would like an answer for every question. And I would like the right one, because I have no use for wrong answers".





A GREEN SEA

While the sea they had seen before had contained every possible shade of blue, now it was green that dominated, a never-ending sea of green: the rainforest stretched below them as far as the eye could see. Lush leaves contended for sunlight, supported by branches that reached upwards at a height of 40 metres perennially chasing the light. Here and there a tree rose above the green canopy, as tall as 60 or even 80 metres, like a green sail above the sea.

Below, thousands of different species of plants competed for light and moisture, growing and intertwining in a dense network of trunks, lianas, leaves and flowers, all the way down to ground level, where mushrooms and ferns thrived. Insects, butterflies, frogs, snakes, monkeys, birds, mammals and predators moved about in the forest. Wide rivers flowed, collecting rain and humidity produced by the forest, providing a home for fish and amphibians.

Ray and Plin descended to the ground, passing from the intense sunlight to the diffused semidarkness of the forest. There was a strange, muffled silence, as if life had stopped in order to listen to them.

Plin looked at Ray quizzically. With a spin, Ray signalled to be quiet and, with another, he gestured for him to look around: huge tree trunks, ferns, ebony and cocoa plants, very tall, slender palms, lianas and beautiful orchids. His mum liked orchids, even if hers always died. Strange, because these ones looked like they were in splendid shape. The silence was absolute, then, little by little, came the shrill cry of a monkey, the song of a toucan, the flutter of a parrot, joined by the croaking of a frog. The animal noises rose in intensity, like the rehearsal of an orchestra, at first in a random and chaotic way, then, as if an invisible conductor had picked up his baton, the sounds took on a magical harmony and the forest began to throb with life.

Plin asked Ray: "How many animals are there?"

Ray spread his spins and sighed. "We don't know exactly, 25% of the living species on Earth are found in the rainforest, tens of thousands of different insects and plants, in continuous evolution, with lots of active ingredients."

"Who are the active... 'indigenes'?" – Plin had just studied the native American Indians, also known as indigenes, and the names of the various tribes that his teacher had listed were running around in a jumble in his head.

Ray smiled and answered: "Ingredients not indigenes, they are substances produced by plants; the people who inhabit the forest have learned about them over thousands and thousands of years and use them as medicines".

"Like a chemist's?" – asked Plin.

"Better, like all the biggest laboratories in the world combined. All we need to do is collect and study them to cure many diseases and better understand how to stay healthy.

"So why don't we do it?"

"Because people prefer to make money by cutting down the trees and raising cattle on pastures that won't last more than a season".

"Isn't it a bit stupid?" – asked Plin, looking around. He was always struck by the stupid things grown-ups did. "Yes" replied Ray bluntly.

"You know Ray, when I tell my dad that he's doing something stupid he never agrees with me; he looks at me in a strange way, says I am too young to understand, and that I will understand when I grow up". Plin sighed and added: "But I'd like to grow up without having to understand why people do stupid things".





COMING HOME

They had travelled half the world and Plin would have liked to travel the other half as well, but how would he be able explain to his mum why the research had taken him so long? Just as he thought about his mum the phone started ringing. Plin took it out of his pocket. As he expected, it was mum on video call. He placed the phone right up close in front of his nose, so that he was the only thing visible and answered.

“Hi mum”.

“Hi Plin, I forgot to tell you something important”.

Mum always forgot to tell him important things. They didn’t seem all that important to him but probably the things that were important to him and mum were different. He kept quiet, knowing that she was very good at doing all the talking.

“I wanted to tell you that, when you get home, you must take your shoes off, I don’t want you to dirty my floor. I’ve been cleaning the whole house because my friends are coming tonight. We have to organise a surprise party. Not for you, or it wouldn’t be a surprise. It’s for Tina’s son. You don’t know him, his name’s Mauro, he just graduated from University and he’s coming back from London. A friend in Milan, Giorgio – you don’t know him - has found him a job, and then...”

Now she had got going, and when she got going nobody could stop her. She could start talking about one thing before she finished another, at such a speed that not even Ray could have caught up with her - and Ray was fast, faster than a Ferrari. But mum’s chatter could fill the forests and the oceans and deserts and all the space on Earth.

“...I just wanted to tell you to take your shoes off when you come in and to be careful not to make a mess. See you soon. Bye”.



Plin closed the video call. Who knows how much it had cost him: he was pretty much on the other side of the world. There shouldn't even have been any reception but, with Ray, everything was possible and so many strange things had happened that he couldn't even remember them all.

It really was time to go home. It felt as if they had been travelling around the planet for a long time. If he was late, mum might want to call Ray's mum... and how could he possibly explain to her that Ray didn't have a mum but only a dad? "And what a dad!" thought Plin, remembering the Big Bang.

"Ray, shall we get back?" Ray's warm smile lit up his face.

"Are you tired?"

"No, but I don't want to be late, you know what mothers are like".

"No I don't, but perhaps I can imagine".

Plin didn't even have time to blink and he found himself in the school yard. Ray was no longer there. He had disappeared just as he had arrived. Plin looked around. It all seemed so strangely normal. He started walking home. His house was only five minutes away and as he walked, he thought about all the places they had visited. Lost in thought, he found himself in front of the house in an instant.

He took off his shoes and looked at the soles: they were dirty with sand from the Caribbean and soil from the Amazon rainforest: luckily, mum had told him to take them off. He put the key in the lock, turned it, opened the door and found his mother standing in front of him.



"Well, what are you doing here? Weren't you going to be with your new school friend working on a research project? If you don't manage to finish it by yourself, I can't help you. My friends are coming over for dinner and now I have to go to work. I'm off to the office, look in the fridge for something to eat, be good and do your research". She planted a big kiss on his forehead and went out, closing the door behind her.

Plin stood there thinking. They had circled the Earth in a flash. Yet they had stopped in so many places to look, listen, smell, comment and reflect. Or maybe he had just dreamed it all?

Then he stepped on some grains of sand that had fallen from the shoes he was holding. They crackled gently under his bare feet. He didn't care what mum would say. He remembered the warmth of Ray on his forehead, smiled and went to his room.

From the window he could see the sun and now he felt like bathing in it for a little longer.

Earth was really a fantastic place.







Achab Group has been involved in environmental education and communication all over Italy for 25 years, developing in-house expertise on teaching in schools of all levels and creating sustainability education projects for public and private companies. It has recently published the ScuolaPark.it platform where you can find video lessons, video readings, teaching sheets, audio books, films, documentaries, short films and cartoons to help understand the principles of sustainability.



Paolo Silingardi

Paolo Silingardi is Chairman of Achab Group, an environmental education and communication agency with specific experience in participatory processes, incentive systems and the start-up of door-to-door waste collection. He has designed formats that have been implemented in hundreds of towns and these include Captain Eco, EcoAttivi, Ecoquiz, Ecovolontari and Scuola Park. He has published “The Dryas Report”, an eco-thriller on environmental change and “Evolution. Posthumous reflections of an Australopithecus”, used to create a theatrical monologue.



Monica Alletto

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COMING HOME

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What can a ray of sun and a boy
do when they meet by chance
in a school yard?
Travel at the speed of light!
So begins a fantastic adventure
that will help us understand the
beauty and the fragility of our planet.

