

The Ice's Exiles

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***Dear Colleagues,
Dear Parents,***

This imaginary story which takes place in Antarctica will help children to discover how climate change is disrupting the life of polar species both on the continent and in the ocean surrounding it.

They will also discover that forced exile, whether climate related or otherwise, is always complicated but necessary for survival. They will realize that human beings are also threatened with exile. This story can therefore open another debate.

Children will also realize that the future is in the hands of everyone, including themselves. The story is therefore an open door to teach them simple actions to save energy and so avoid any climatic exile.

Myrdef, a pretty fairy with white hair, was wearing a big hat protecting her from the sun. She was walked slowly down the pier stepping into the ocean...

Sadly, while contemplating the horizon, she remembered the beautiful moments spent on the white continent. This is where the wind was stealing her hair colored ice and where sometimes she helped a scientist, a cook, or a pilot with her magical powers. This is where she felt very useful.

- *Now, with the new technologies, everything is very different in the icy country. I have become useless and sad, she thought.*

My hair reminds me of the sea ice too much. I've decided, tomorrow I'll dye my hair the color of the sun! she said to herself while looking the ocean, which seemed a bit rough.

When suddenly, far off, a funny little dot appeared ...



For a short moment, recognized the head of a seal. It is a cousin of those who live in the ice country. He was swimming in her direction and Myrdef was delighted. She watched it for a long time.

- *Weird! It's really weird! She said to herself when he approached.
He's holding something black in his mouth.*

Curious, Myrdef would have liked to fly closer to discover what it was in his mouth. But there were too many people on the pier and she did not want to attract anyone's attention.

As the seal approached closer, her beautiful white hair began to curl announcing the beginning of a new adventure.

Intrigued and shivering, she waited patiently...



Tiphok, intruded himself and sent his parcel in the direction of Myrdef with a stroke of his tail.

- *Pay Attention! exclaimed the splashed fairy, discovering at her feet a large penguin feather.*
- *Sorry! said Tiphok, but this feather has been drifting in the ocean for a long time. Take a closer look, white-haired fairy! There's something weird about it.*
- *Shh! Don't call me that. No one here must recognize me, replied the fairy.*

But Tiphok, who had not been able to eat during his long journey, had plunged deep into the ocean in search of fish and had disappeared.

Myrdef picked up the feather and examined it closely. On the quill there were three engraved capital letters that spelled: "SOS ".

Unbothered without worrying about anything else, Myrdef spread her pretty wings and flew away to the white continent where many penguins lived.



But even for a fairy, the journey to the icy continent was very long that Myrdef had to stop!

One evening exhausted, yet almost there, she fell onto the deck of a boat with the scary name of "Blizzard". This is also the name of a violent and icy wind that haunts the polar regions and once ruffled her long white hair.

On board where wealthy tourists, probably envious of feeling the cold sting on their cheeks, discovered polar magic and took pictures.

In order to attract no one's attention, Myrdef quickly folded her wings and hid her long hair under a pretty pompom hat.



At the same time, near the white mainland, Chucky the little penguin was drifting alone on his block of ice. He was starving, but did not dare to dive in search for food because there was a sea leopard lurking and ready to eat him. So, he clung to the ice and was well sheltered from any enemy assault.

He began to think:

- Where are my feathers that I painstakingly engraved SOS with my beak and threw in the ocean so long ago? No doubt, are they lost forever. No one will come to our aid anymore, and we the penguins, will probably disappear... Yet I would have tried to launch an alert...*

And with this sad thought, she fell asleep hoping that the sea leopard would be tired of the war and eventually go away.



Not forgetting her mission, the white-haired fairy who was somewhat rested, flew as quietly out as she had come.

She saw a friendly boat coming and saw a glimpse of Sylviak. A biologist that gave the passengers details of the white continent with so much passion, that Myrdef turned around to listen. She guessed that he was a future polar friend.

Flying away for good this time, she took off her cap and showed herself to him. She sent him from afar a kiss as icy as the ocean.

Sylviak, was flabbergasted and shivered with joy . . .

*Near him on the deck, was a pompom cap that seemed to belong to no one.
He picked it up.*



On this white continent, the dreaded blizzard wind is never far away. The wind, happy to find the fairy, suddenly got up and pushed her. Myrdef got angry.

- *Take me to the penguins if you want to be useful! And stoppe ruffling my hair and turning me into an ice fairy! She grumbled.*

But the blizzard wind had more fun and blew her:

- *You're so pretty little ice fairy. Hang on I'm taking you to Adelie Land.*

Clutching the penguin feather against her heart, her hair begins to freeze and Myrdef let herself be carried away. She was still sad that she dropped her pompom cap.



A serious investigation began when she arrived on the white continent.

On top of an iceberg, Myrdef noticed a funny penguin named Tunny who was talking to himself.

- I'm the champion the penguin who dives the deepest, he repeated out loud.

Slowly, not to frighten him the fairy approached Tunny and asked:

- What do you see when you dive so deep? Starting a conversation.

With much surprise instead of answering the question, Tunny grabbed her and dove into the icy ocean.

Myrdef, though gripped, did not recognize the marine life that she knew very well. So, the changes in the icy ocean were impressive.

She discovered huge crabs that were like powerful kings. They had invaded this new frozen territory to expand their kingdom... and was she horrified.



- *What are you doing with a feather from Chucky? Tunny asked curiously as he came out of the water and sat on an iceberg, while Myrdef let the wind dry her.*

Still annoyed by what she had seen, the fairy did not answer. But Tunny being very curious asked her again.

- *Why do you have a feather of Chucky with you?*
- *Ugh! Who's Chucky? asked the white-haired fairy who was coming to her senses.*
- *She's my friend and left the colony.*
- *Take me to her! Begged Myrdef, so gently that Tunny agreed.*
- *...but by flying this time.*
My white hair is finally dry! She apologized grabbing Tunny who was puzzled.



As soon as Myrdef saw Chucky, the little penguin, she knew that something was wrong.

Immediately she used her fairy powers to scare away a leopard seal who was lurking around her. She ordered Tunny to also bring back some fat fish for her.

Once full, she was very excited to see her feather with SOS in Myrdef's hand that could hardly speak.

Leaving Tunny to take care of Chucky, Myrdef flew towards the coast to meet the rockery, a large colony of penguins.



Myrdef was pretty like all fairy's in world and in her secret pocket she always carried a bottle of perfume.

- *Very useful here! she said to herself smiling.*

Although icy, the subtle flower scent which she sprayed on herself, camouflaged the smelly guano of the united penguins. The white-haired fairy who was adorned hide behind a rock to observe these birds in their black and white costumes.

- *Hey! She says to herself. There are not many chicks in this colony. This is not very normal. Where are they hiding? I'd like to find them without them see me.*

She then hailed a cloud passing over her and settled comfortably into the soft lining.

- *Can you take me some time over this colony, pretty cloud? she asked politely. I'd love to see and hear what's going on there.*

The fairy smelled so good that the cloud blushed and with pleasure could only accept ...



- *Hey! This is Master Zaziko, Chucky's friend! As usual, he is angry. I think he scares Chucky, said the cloud. The fairy was astonished that he knew everything.*
- *Why do you call him "Master"? asked the fairy.*
- *There is no school here and because he gives everyone, especially the younger people, they all call him "Master". It is effective, but he is in such a bad mood, said the cloud.*
- *Where are the chicks? I only see a few, asked the fairy.*
- *Dead, Frozen and Hungry!! Sobbed the cloud.*
- *Do not cry otherwise I will fall! Myrdef shouted, but please explain to me.*
- *It is because of the changing climate. But come this way, it feels bad here, replied the cloud.*

Although worried, the curious fairy let herself be carried away.

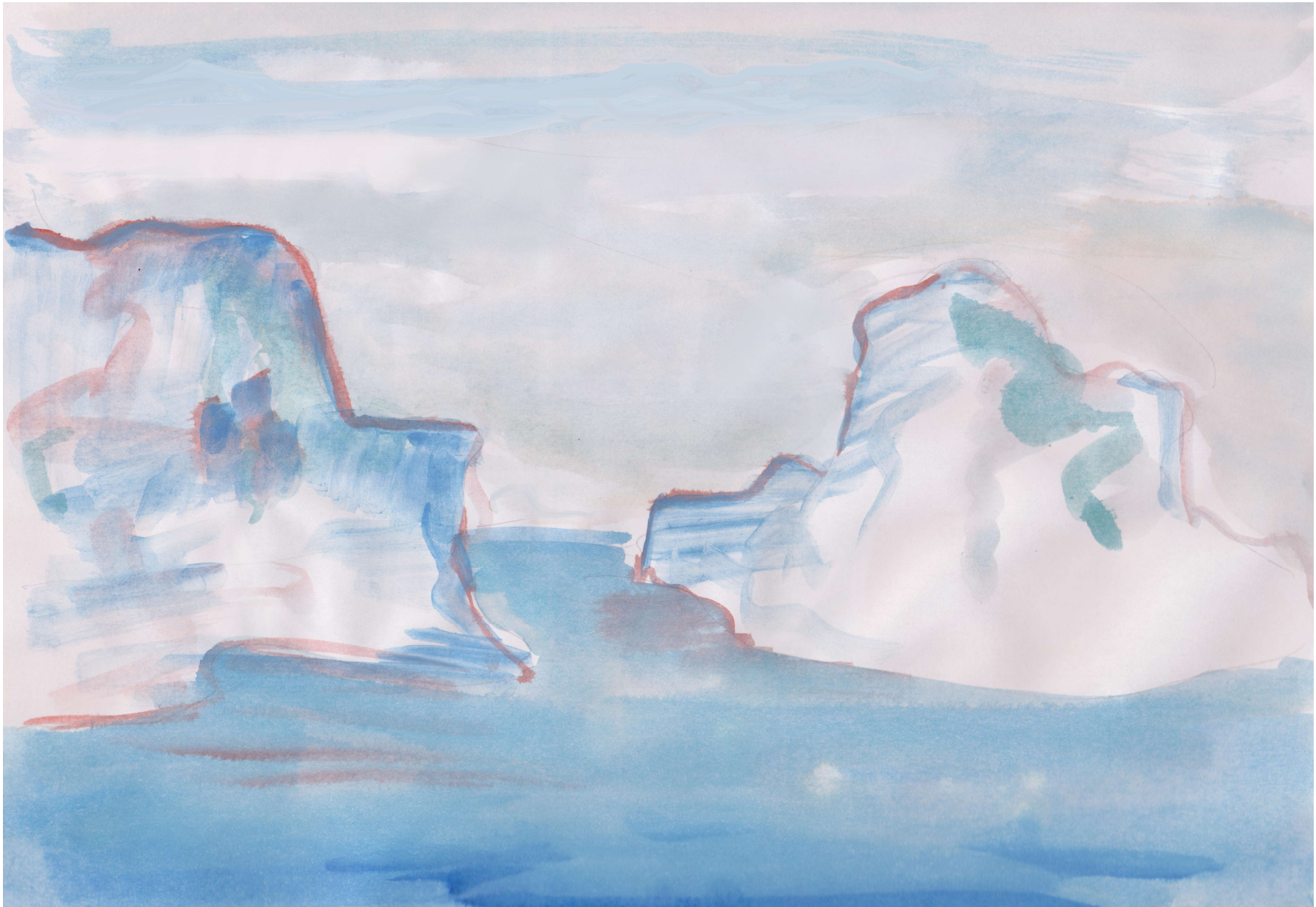


The cloud descended through the fog into the middle of nowhere, in this magical place of polar beauty on the white continent.

- *“Everything changes around here,” he confided. And that poses big problems to the penguins.*
- *Often large icebergs detach from the glaciers and drift in from of the coasts, preventing the sea ice to break up in the Summer. The penguins are forced to go further out to dive for food to bring back. When they finally come back, it is often too late and the babies die of hunger.*
- *And then cloud sadly continued, “when I cry sometimes, it rains instead of snowing because it warmer.” I also know that the feathers of baby chicks are good for dry cold like snow, but are not waterproof against rain. When they are soaking wet and the cold temperatures quickly returns, they will freeze and die.*
- *What is going on here, I do not understand? Moaned the cloud.*

Against the advice of Master Zaziko, Chucky left alone seeking help and never returned. Since then, Zaziko has been angry.

Very moved, the fairy felt her ice-colored hair freeze and freeze, forming very tight curls.



It took Myrdef time to overcome her fear...but a fairy has powers! She now thinks how best to use them.

- *Pretty cloud, can you lead me again over the penguins. I need to know them better in order to help them.*
- *“I cannot”, replied the cloud. I need the wind and it too has changed. It became irregular in places and blows less than before.*

But Myrdef was no longer listening. Reluctantly she left her comfortable shelter and grumbling against the wind she flew alone towards the rockery.

On her way, she noticed that in places the sea ice had melted and so all was not lost!



- *Save yourself! Save yourself as long as there is time! Repeated Myrdef energetically at the penguins for several days.*

Chucky and Tunny from a distance recognized the fairy's voice. Sliding on their bellies as fast as they could, they went on the road to their colony. They had to save their friends.

Just up ahead perched on an iceberg barely visible, Myref smiled when she finally saw Chucky followed by almost all of the colony. They were in search of the voice that would guide them.

Discreetly the fairy took them through the ice-free water channels far away. Then there was silence.

- *Not it is up to them to find their way to a new life! She thought happily.*

Myrdef, however noticed the sadness in Chucky's eyes. She realized that Master Zaziko was still angry and didn't want to follow the group. Instead to stay with the weaker ones. Myrdef's heart was pinched.



The fairy's beautiful fair hair was unravelling and she believed her work was finished. So Myrdef relaxed.

On this beautiful day, she decided to warm up with the rays of the sun while sitting on a rock and contemplating the grandiose landscape that she loved so much.

- *Hey fairy! You better move if you do not want your proteges all crunched! Shouted a very rude bird from the sky.*

And to make sure the fairy understood the message, he dropped a packet of smelly guano on her white hair.

Furious and worried, Myrdef flew away and her hair curling again with fright.

On the road to the penguins, there were many predators. Killer whales and leopard seals were looking to satisfy their hunger by trying to eat the slowest and most tired penguin.

- *The ocean is a hard fight for the inexperienced youth! I have to help and guide them! She panicked.*

With all of her strength, and as fast as she could fly, the fairy searched for safe land where the penguins could settle...



- *Wow! Said the fairy as she rushed through a narrow opening lined with large cliffs, that had red and gold snow capped peaks. What a beautiful place all surrounded by sea ice!*

Pretty fumaroles (a small opening) where fountains of water vapor escaped from the ground.

- *Wow! Repeated the fairy. It is the crater of a collapsed volcano and the ocean has entered into it. A dream place for penguins!*

But the fairyhood lasted only a moment when many of the leopard seals eating penguins occupied the place.

Disappointed, the fairy continued on her way and called forever this place “Deception Island” even though it was wonderful.



From island to island, rejection to rejection and deception to danger, the fairy was discouraged. Nobody wanted to share their territory with newcomers.

Because of exhaustion, she let herself fall onto a piece of floating ice near the edge of the ocean. But at the moment of keeling over into a deep sleep, she thought she heard :

- *We love your ice-colored hair pretty fairy. Let yourself be carried by the sea ice! It will take you where you need to go. Hang in there!*

Myrdef did not really know what was happening to her. In her dream she had felt jostled, crushed and tossed ... but when waking up, she found herself in the middle of thousands of penguins smelling disgusting guano!



- *Where am I? asked the dazed fairy.*
- *I cannot tell you, answered the young penguin. Just know that there were a lot of dangers to face to reach us, but here we are safe and there is enough food for all. She then dropped a fish at the fairy's feet.*

In front of so much kindness, the fairy's hair untangled and gracefully blew in the wind. A drop of perfume made Myrdef forget the smell of her guests.

The fairy then closed her eyes and, in her heart, made a wish that Chucky and his colony would find this welcoming place she named "Isle of Danger".

Seeming to read her thoughts, the little penguin added:

- *Eat and do not worry about your friends! The wind told us everything. Niviak, the most athletic within the colony, went to meet them in order to show them the way. They will be arriving soon.*



- *What a relief! Said Myrdef to herself, seeing Niviak faraway leading the colony of penguins. A new life begins for them.
What a beautiful exile! She thought again.*

The fairy flew to meet them and realized that many penguins were missing the trip. An orca probably had crunched them.

She also saw that Chucky was crying.

Her fairy heart understood many things, even those that were not said out loud. She knew that the little penguin secretly loved Master Zaziko, despite his mean temper and that this forced exile was a wrench for her.

- *Exile is really not nice! Thought Myredef sadly. She understood that at this moment most of the exiled penguins even if welcomed, still have a desire to meet again those of which they were separated from earlier.*

The fairy did not show herself as she had to think....



Now and then Myrdef wandered indecisively not knowing what to do, when by chance her path crossed again with the luxurious tourist boat the “Blizzard.”

When she saw it, she smiled?

- I’ll give myself a little rest, she said to herself very tired and take a chance to find my pompom hat.

Wings folded as she settled comfortably on the bridge. Absorbed in her thoughts, she did not see sylviak arrive.

Intrigued by the hat of this unknown passenger, and very similar to the one he had strangely picked up, Sylviak decided to start a conversation.

But Myrdef recognized him right away and decided to confide in him. She explained about the forced exile of the penguins, but did not reveal the secret hiding place to him.

A fairy rarely confides....But in this magic moment, the sweetness and depth of the white-hair fairy invaded Sylviak. He shivered with joy and knew that his life was going to change!



To this unexpected, attentive and competent companion, the fairy asked some questions?

- *Why do big crabs invade the cold waters of the Antarctic Ocean?*
- *Why does the sea ice change and force penguins to walk many extra kilometres/miles to find their food?*
- *Why does it rain instead of snow, killing the penguin chicks because their wet and their plumage is not waterproof?*

Sylviak was embarrassed and even blushed, because he, the expert knew that global warming was the answer to all of her questions. He also knew that human's activity was largely responsible of this global warming. He did not dare to answer.



Myrdef, who could read minds, understood the dismay of her companion. She did not insist, but looked him in the eye and secretly made a wish. She then flew away, deliberately dropping her hat near sylviak.

Disturbed, Sylviak picked up the hat and stopped with great fright.

- *If the climate continues to warm up, I too will be like the penguins. I will have to leave my beautiful house by the ocean and exile myself and family. Where will I go? Where will I be welcomed?*

Trembling, he threw the hat into the sea furious that he had met the fairy. But the fear still tugged in his belly....



Since that day, to whoever would listen, Sylviak repeated the urgency and importance of limiting the release of CO₂ into the atmosphere. He also stressed how important using renewable energy was and to change our consumer habits.

The fairy with her long white hair watched that Sylviak was very active and effective helping to fight global warming that she removed the fright from his belly.

Since then, the pretty fairy flies around the world incognito and makes the best use of her gifts to alert everyone to the urgency of the matter.

She often visits the white continent to help her penguin friends, that were exiled from the sea ice. She takes the opportunity to rekindle the whiteness of her long hair that will never become the color of the sun but stay the color of the sea ice.

*And you will let Myrdef and Sylviak fight alone this important fight?
Or will you help with simple changes to save the devastating energy of CO₂ so that no one on earth will become like the “climate exiled” penguins.*



Educational note :

Teaching children about severe exile and climate change is important. Helping them find solutions to save energy is just as important, however they are children. So, Professor Atchoum offers to lighten the subject with a " penguins' game " ... to teach them more about these black and white birds.

Penguins' Game

Rules of the game

Preparation: (see board games)

the game board, pawns, a dice, the rules of the game

All players roll the dice. Whoever has the highest points starts the game. The other players follow in a clockwise manner, by advancing their pawn of the number of spaces indicated on the dice.

The Game:

Starting the Game:

Put your pawn on the sea ice in front of square 1 ... Be careful not to slip!

The squares can only hold one pawn. If a pawn lands on an already occupied square, the two pawns switch places.

Each time the pawn stops on a square with a number written in red, something happens!

3. The penguins are big seabirds that do not fly.They live mainly in Antarctica (South Pole).

In the water their wings serve as fins. The emperor penguin is the king of diving! It can reach 650 meters deep. **Dive with it! Advance of 4 spaces.**

6. Some penguins have fun to sliding on their belly ...

Slide with them! Advance 2 spaces.

9. In the "penguin" family, both the father and the mother pay equal attention to the survival of their offspring. The parents help each other with hatching the chicks, keeping them

warm, feeding them and protecting them from predators. It requires a lot of energy, so they fast for several days using the calories from their fat layer under their skin.

Lose weight with them ! Back two spaces.

12. To rest in the water, the penguin floats on his belly with its head erect like a duck.
He uses his fins like oars. His back is the color black to absorb the heat of the sun.
It is also confusing with the dark color of the water, barely making it visible to those which are watching it on the surface.
Because the reflection of the light is on the water, his white belly is not very visible by the other big animals that swim and want to eat him.
So, rest with him in tranquility! Wait until all the other players have passed you.
If you are the last, skip a turn.

15. In order to move quickly to flee or hunt, the penguin swims under the surface of the ocean and frequently jumps out of the water to breathe. This is called "porpoising".
This technique of displacement is also used by dolphins and porpoises.
Porpoise with them! Advance 2 spaces.

18. There is not a lot of fresh water on Antarctic because everything is frozen.
To drink, the penguin pecks on the ice with its beak. When he dives and catches his food, he does swallow seawater. It doesn't matter because his glands eliminate the salt on the base of his beak.
Peck the ice with him! In the next turn, advance only half of the points you rolled.

21. To fight against the cold the penguin has 3 layers of protection:
- 1: under the skin, a thick layer of fat - 2: on the skin, a tight down
- 3: on the down, rigid and impermeable feathers placed like scales.
In this extreme climate, the feathers of penguins therefore have a very important role.
They must always be in perfect condition. That's why every year after breeding, the penguin moults: that is where his old feathers fall off and new ones appear. It takes

about two to four weeks. During this period, the penguin cannot dive. He is forced to fast.
Fast with him! Stay where you are, 2 rounds without playing.

24. The penguin has a funny way of walking. He seems not very skilled on his 3-fingered webbed feet. Yet he walks as fast as a fast man (+/- 6km / h).

To keep its balance when he runs, he stretches his fins backwards.

He will walk many kilometres on foot or by his stomach, to finally reach the nesting place. Some of the "emperor" penguins can sometimes do as much as 150 km.

Walk with him! Advance one space.

27. Every winter when the temperature is at the lowest, the penguins gather in huge rookeries and they will reproduce. Many penguins will find the same love partner from year to year. This is especially true despite the hard-climatic conditions, and if the previous brood went well. The courtship ritual lasts for several weeks. Each species has different rites, but all make a lot of noise!

Follow them in their noisy ritual! Return to space number 25.

30. After the breeding season, the emaciated penguins return to sea to eat til they are full, refilling their reserve. They love to eat fish, squid and krill (small crustaceans).

Search with them what to eat! Advance 2 spaces.

33. The Adelie penguin is the one we see the most in Antarctica. It is not very tall (+/- 70cm) and weighs only about 4kg. It is easily recognized because of a thin white halo around its eye on its black head giving him a naughty look. Despite its efforts to protect the nest, a skua (marine bird) comes to steal its egg.

You must start all over again! Go back to space one.

36. Emperor penguins do not build a nest. They keep the egg warm under their belly and on their paws. Penguin mom will pass the egg to penguin dad, however they must be very careful so that the egg does not roll on the ice.

Do not bother them! Move back one space.

39. If it wants to get out of the water without being eaten by a leopard seal who is watching you, the penguin has only two solutions :
either let itself be swept away by a wave, or make a jump onto the ice.

Jump with him! Advance one square.

42. The orca is easily recognized because of her black dress with big white drawings.
She is part of the family of whales that have teeth and feeds on fish, but also seabirds and seals. She likes to eat penguins

Alas for you! This orca caught the penguin. You are penalized.

Everyone advances two spaces except you !

45. When the blizzard is blowing hard, the emperor penguins shake against each other forming a very tight circle to stay warm. They say they make "turtles".
They take turns from the inside out of the circle so that it's not always the same penguin which is cold.

Warm up with them! Stay on your space without playing.

48. **You won!** You joined these beautiful penguins.
Enjoy the midnight sun with them!

Game over

You must land exactly on space 45!

If you pass space 45, go back the number of points in excess!

" You must be the change you wish to see in the world "

Mahatma Gandhi

Dedicated to

Claude Lorius, glaciologist, CNRS Gold Medal, pioneer in Antarctic research. He discovered the link between climate history and the composition of our atmosphere, thanks to air bubbles in the ice. He is always ready to raise children's awareness of climate problems.

May he pass on his passion for ice to them.

Sylvain Mahuzier, biologist and teacher training, naturalist guide, polar specialist and lecturer.

*May he open everyone's eyes
on major climate change in polar countries.*

Stéphane Niveau, scientific and cultural director of "Espace des Mondes Polaires Paul Emile Victor".

*May he raise everyone awareness of climate change
through its activities and suggest solutions that can be achieved by everyone.*

*For their verification of the scientific fact,
But mainly for always being there*

from the bottom of my heart

MANY THANKS