

MARIANA

and the battle
against the

ghost storm



**THE THREAT POSED
BY MARINE DEBRIS**

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Federative Republic of Brazil

Jair Messias Bolsonaro
President

Interministerial Commission for the Resources of the Sea

Ilques Barbosa Junior
Admiral

Environmental Ministry of Brazil

Ricardo Salles
Minister

Creation and Text

Alexander Turra
Elisa V. S. Menck
Márcia R. Denada
Monique Rached

Graphic Project and Final Art

Monique Rached

Translation and Diagramming

Elisa V. S. Menck
Monique Rached

Translation Revisor

Carolina Rezende Arentz
Daniel Van Sluys Erlich
Rebecca S. Brianceau

Work Coordinator

Alexander Turra

Production

EnTenda o Lixo Program

Acknowledgements

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Sabrina Pereira, Sandro Costa.

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DAUGHTER, LISTEN TO YOUR AUNT AND UNCLE AND HAVE A NICE TRIP!

SURE DAD. GOODBYE! SEE YOU SOON!



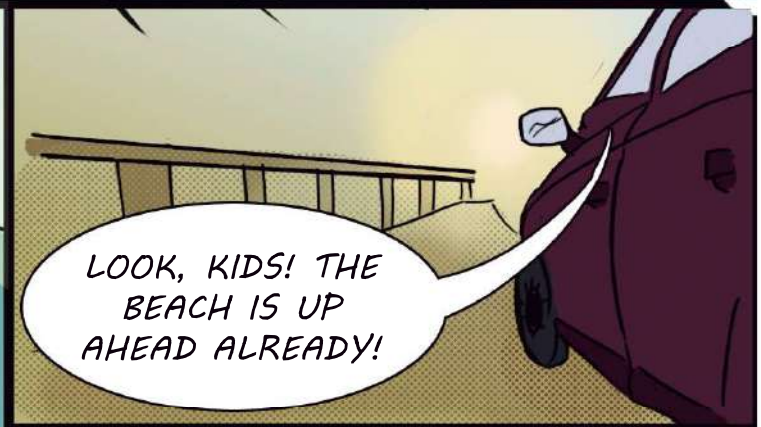
HI, MARIANA!

HELLO AUNTIE, HI UNCLE!! HI LUKE, HI ANA!



YAY, I'M SO EXCITED!

YOU WILL LOVE THE BEACH, MARI. WE'RE GOING TO HAVE A LOT OF FUN!





AT THE BEACH

THIS IS OUR FAVORITE BEACH, MARI. HERE WE HAVE ALL WE NEED.

COME ON, KIDS. WE HAVE TO FIND A SPOT TO SET OUR BEACH UMBRELLA.

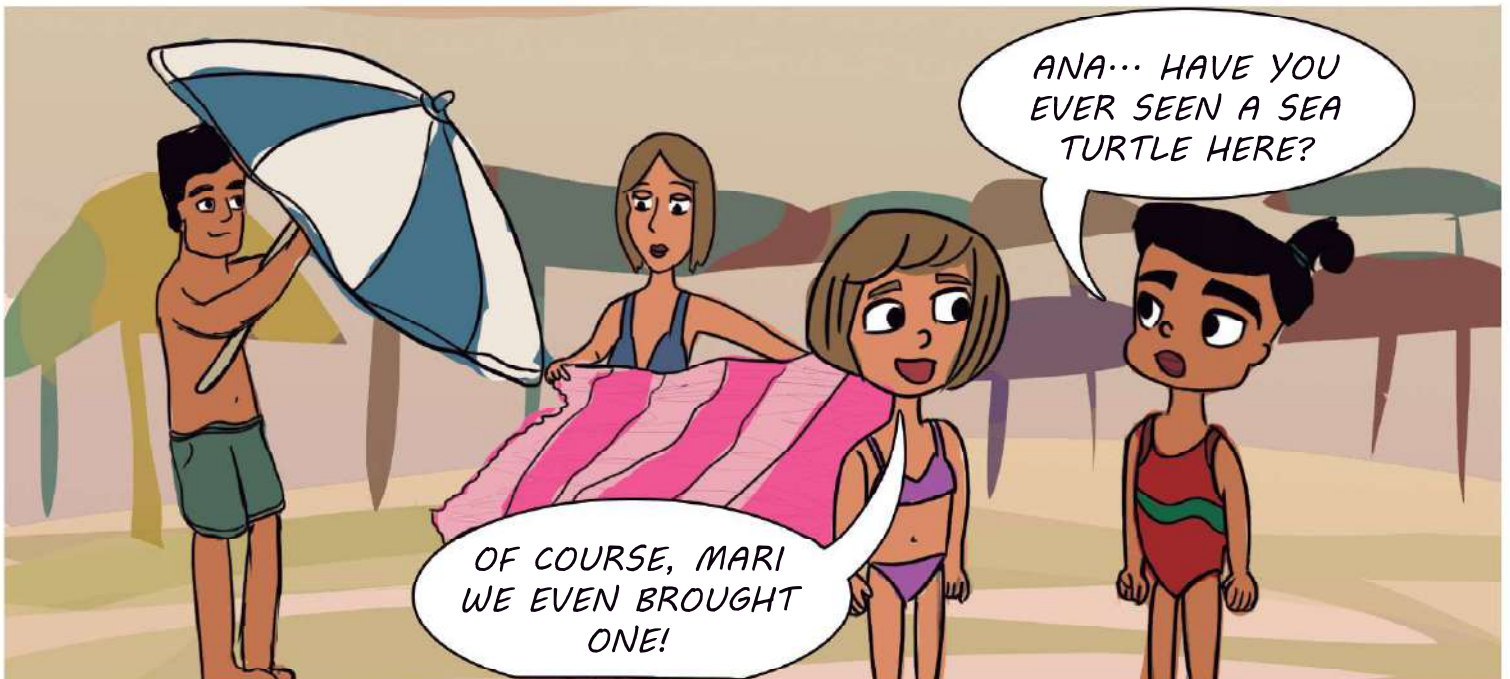


THERE'S A FREE SPOT OVER THERE!



ANA... HAVE YOU EVER SEEN A SEA TURTLE HERE?

OF COURSE, MARI WE EVEN BROUGHT ONE!





LUKE IS BLOWING IT.

WHAT?



COCONUT WATER, ICE CREAM...COME ON, IT'S FOR SALE!!!

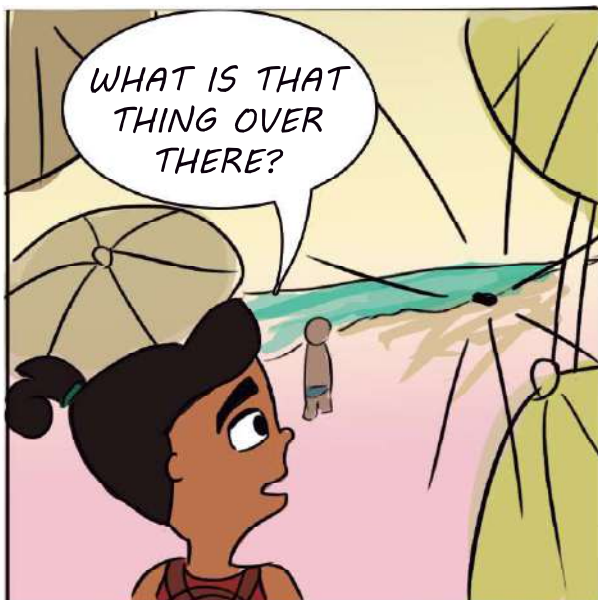
YES, I WANT A CHOCOLATE ICE CREAM!

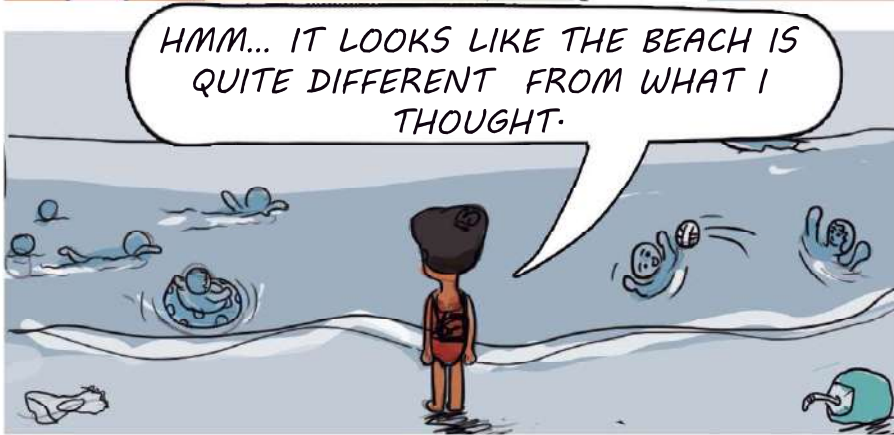


...SUNGLASSES, BEADS FOR SALE...

AND I WANT TO BUY NEW SUNGLASSES.









NO, I WASN'T GOING TO GET ANYTHING. I WAS JUST STARING AT THIS RUBBISH.



RUBBISH? AND YOU EVEN CALL MY FOOD, RUBBISH? LISTEN, GIRL...



YOU ARE A REAL ANIMAL!

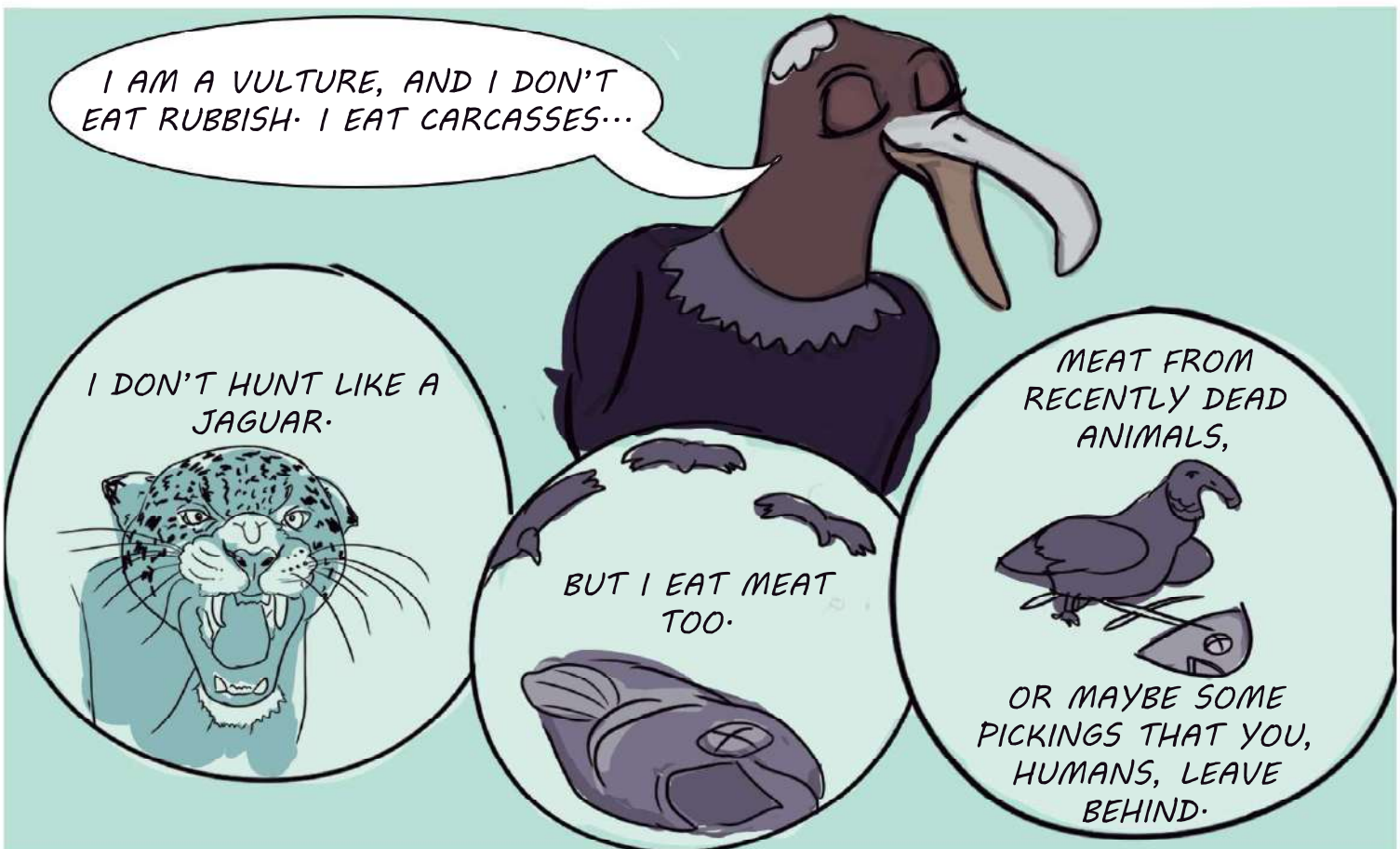
WHAT'S YOUR NAME?



WELL... IT'S BEEN A LONG TIME SINCE SOMEONE HAS ASKED ME THIS

START TAKING NOTES, GIRL.

MY NAME IS URULISSES.

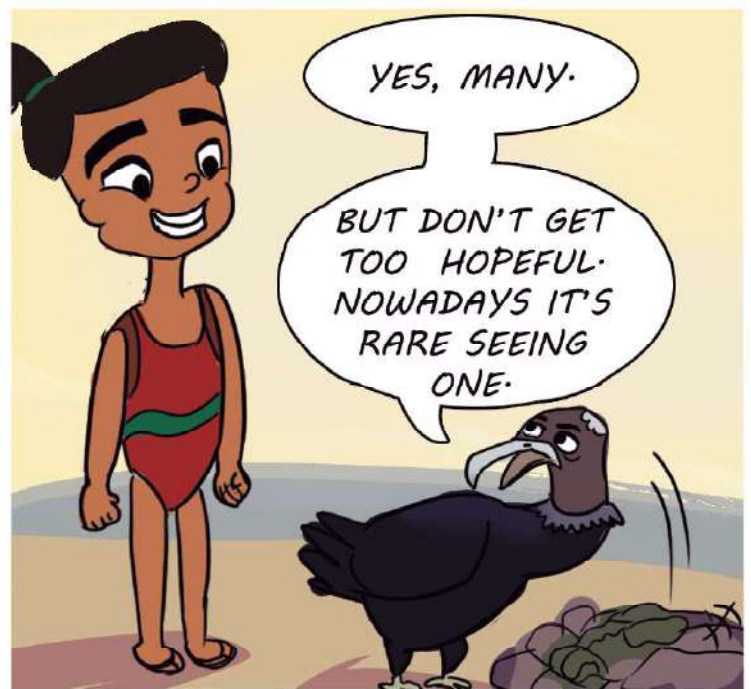


I AM A VULTURE, AND I DON'T EAT RUBBISH. I EAT CARCASSES...

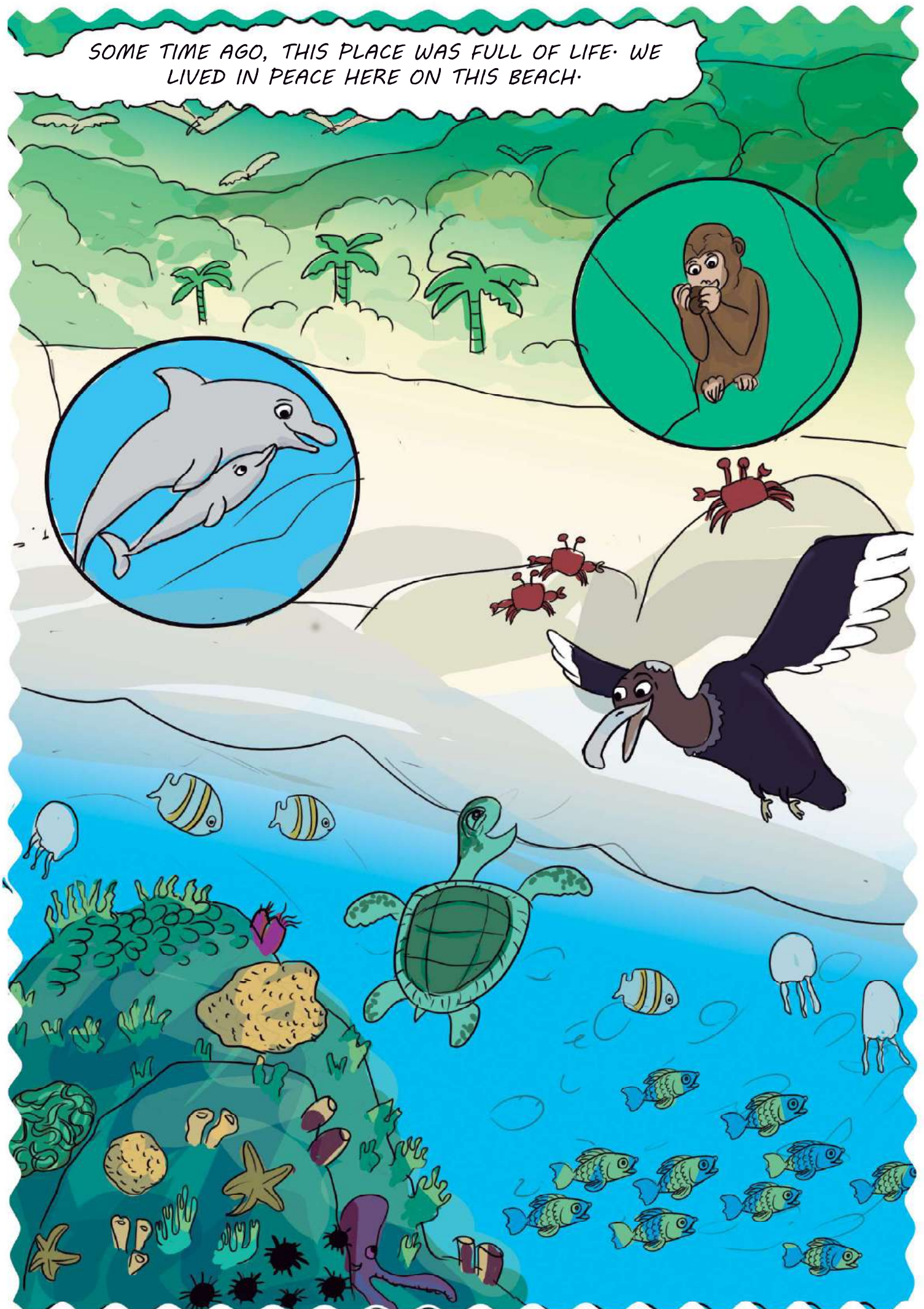
I DON'T HUNT LIKE A JAGUAR.

BUT I EAT MEAT TOO.

MEAT FROM RECENTLY DEAD ANIMALS, OR MAYBE SOME PICKINGS THAT YOU, HUMANS, LEAVE BEHIND.



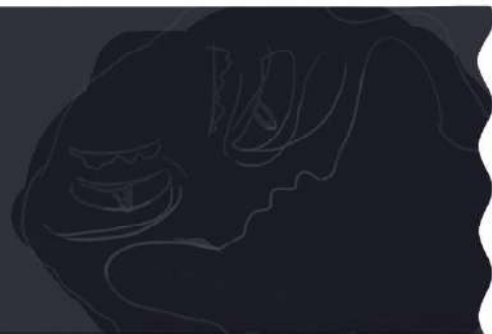
SOME TIME AGO, THIS PLACE WAS FULL OF LIFE. WE LIVED IN PEACE HERE ON THIS BEACH.



HOWEVER, A WHILE AGO THE BEACH STARTED TO GET CROWDED WITH HUMANS...YES, YOU ARE ALWAYS DOING YOUR WEIRD THINGS, BEING LOUD AND INTIMIDATING.



BUT WHAT'S EVEN WORSE IS THAT YOU HUMANS BROUGHT MONSTERS WITH YOU. ACTUALLY YOU BROUGHT AN ENTIRE GANG OF THEM.



THEY WERE SO MANY, THEY ARRIVED LIKE A STORM! ATTACKING ANYONE, MERCILESSLY...



THEY CAME FROM EVERYWHERE, SOMETIMES THEY EVEN DISGUISED THEMSELVES AS FOOD... WE CALL THEM **THE GHOST STORM!**

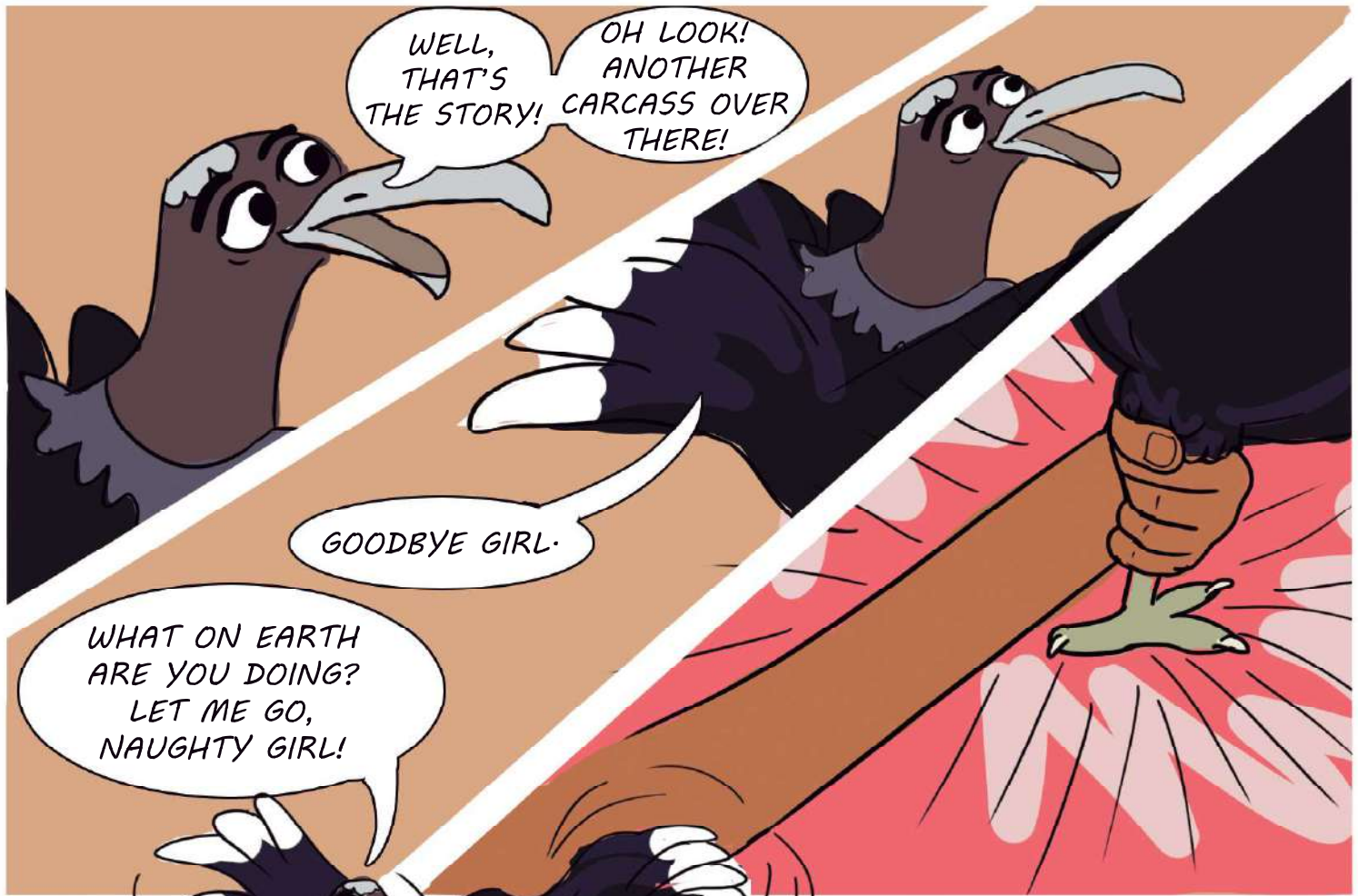


...EVERYONE THAT COULD, LEFT
THIS PLACE...

...THOSE WHO STAYED, LIVE IN
FEAR OF A NEW ATTACK...



TODAY, THERE'S
ONLY A FEW OF US
LEFT, AND THE
HUMANS THAT COME
HERE ARE NOT NICE
TO US.



WELL, THAT'S THE STORY!

OH LOOK! ANOTHER CARCASS OVER THERE!

GOODBYE GIRL.

WHAT ON EARTH ARE YOU DOING? LET ME GO, NAUGHTY GIRL!



HEY, WAIT, PLEASE. I DON'T WANT TO STAY HERE ALONE.

CAN I GO WITH YOU?



HUMPF! OK, FINE. I CAN WALK WITH YOU...



BUT BE AWARE, THE SAND HIDES LOTS OF DANGERS...



OUCH! I STEPPED ON SOMETHING!



POF

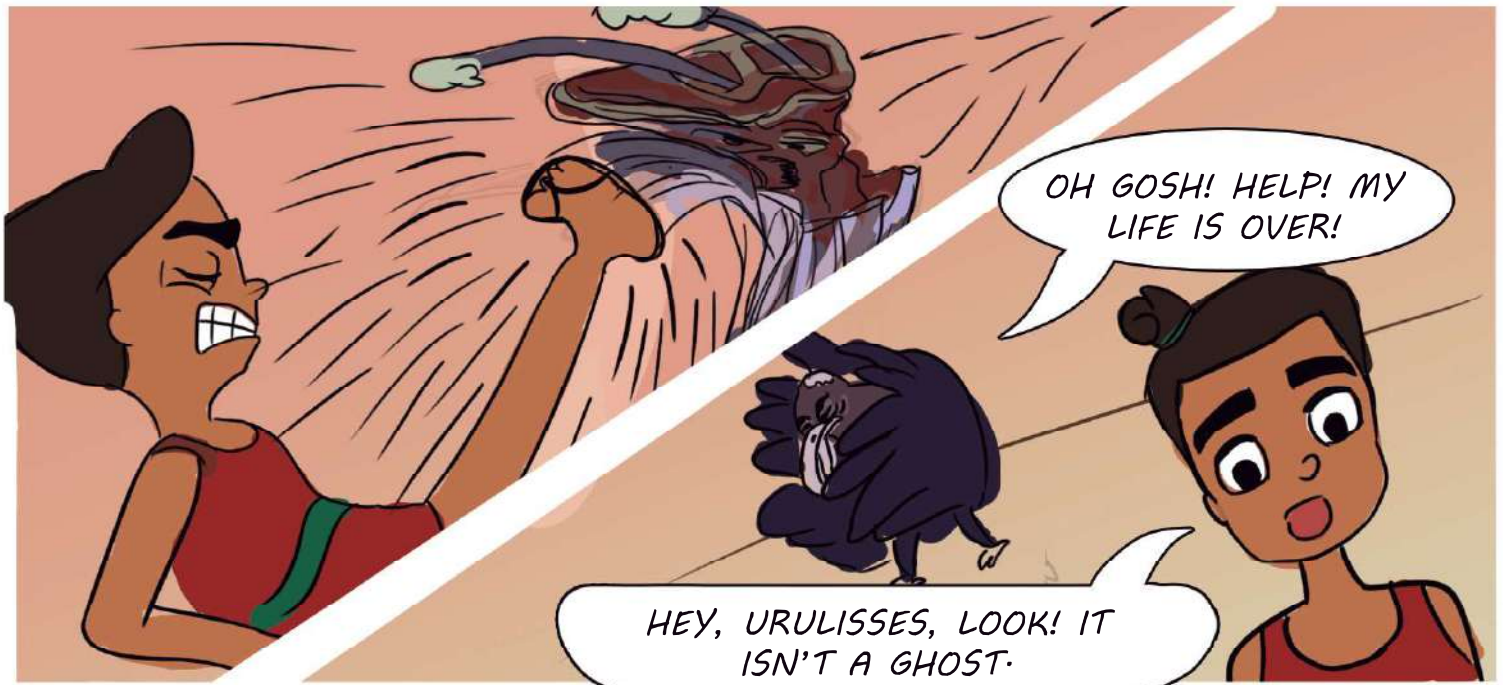


AAAHH!



AAAAAH A GHOST!

I TOLD YOU IT WAS DANGEROUS TO WALK ON THE SAND!!



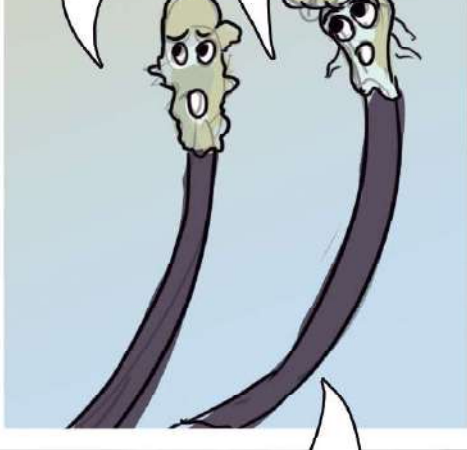
HEY, URULISSES, LOOK! IT ISN'T A GHOST.



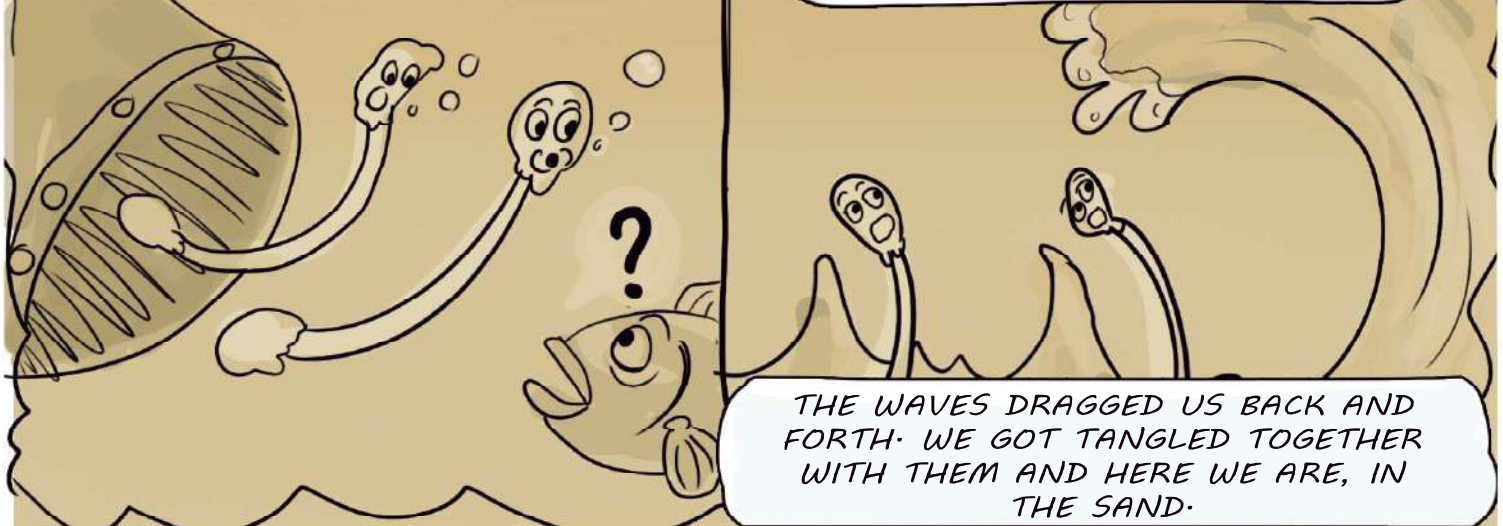
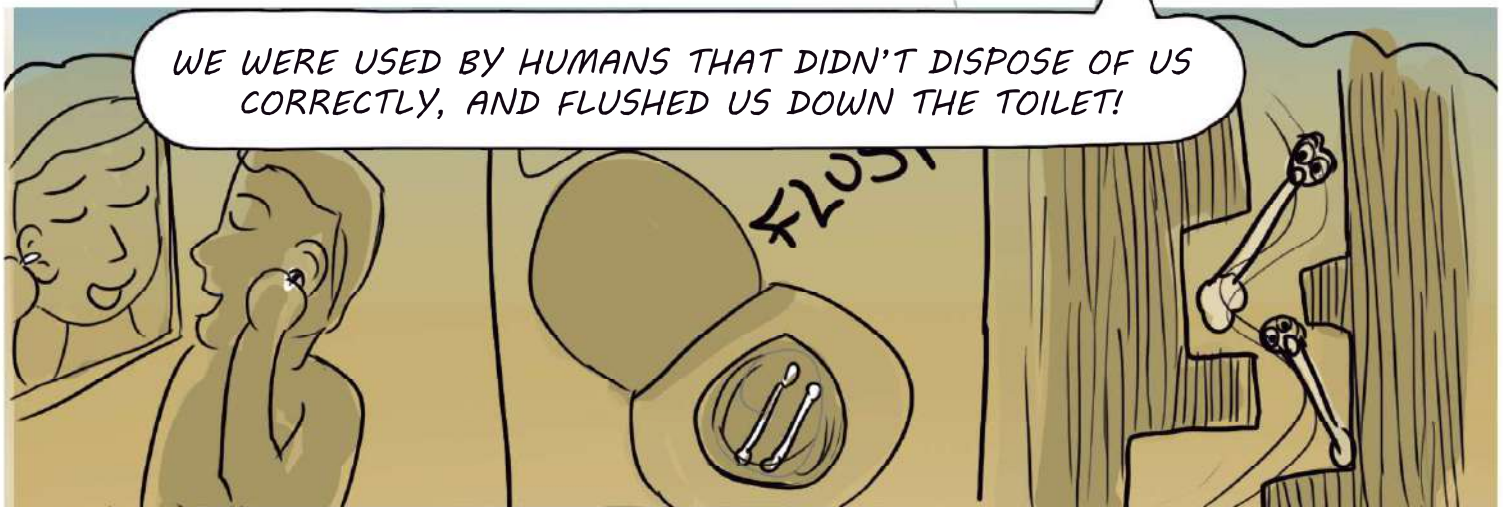
GHOST? NO WAY! I AM JUST A CAN.

AND WE ARE COTTON BUDS. WE HELP TO CLEAN PEOPLE'S EARS.

AND I AM A PLASTIC CUP, OR AT LEAST, I WAS ONE.



WE ARE HERE, THROWN AWAY AND FORGOTTEN. WE ARE CALLED TRASH AND SEEN AS THE BAD GUYS. WE DON'T WANT TO FRIGHTEN ANYBODY. WE ARE WHAT REMAINED FROM WHEN WE WERE NEAT AND USEFUL.





GOOD GRIEF! I DIDN'T KNOW PEOPLE THREW CUPS INTO THE TOILET BOWL!

IT WASN'T THROUGH THE TOILET BOWL THAT I GOT HERE.



MY STORY IS DIFFERENT. IT STARTED TEN YEARS AGO. OH, IF ONLY THAT LITTLE BOY HAD LISTENED TO HIS TEACHER...



I'VE BEEN STROLLING AROUND THE SHORE SINCE THEN AND NOBODY HAS REAPED ME.



BUT HE THREW ME THROUGH THE BUS WINDOW...

SOME PARTS OF ME GOT LOST IN THE SEA. OTHERS LAY UNDER THE SAND, AND SOME PARTS WERE EVEN...SNIFF... SWALLOWED BY ANIMALS!



WOW! I DIDN'T KNOW THAT PLASTIC TEARS UP LIKE THIS! I'VE LEARNED AT SCHOOL THAT THE MATERIALS WE USE CAN TAKE A LONG TIME TO DISAPPEAR IN NATURE.

OH GOSH! I DON'T WANNA BE LOST FOR SUCH A LONG TIME! HELP ME!

AND YOU, CAN WHAT'S YOUR STORY?

IT WAS RIGHT NOW. SEE THAT GUY THERE? HE THREW ME AT THE SEA AFTER HE FINISHED DRINKING!





DAMN, MARIANA, IT'S ANOTHER GHOST!!!



COME ON, SHOW YOURSELF!
I'M NOT AFRAID OF YOU!



NO, MARIANA, BEWARE!
THIS GHOST REALLY HURT
THE SAND CRAB!



OH REALY? SO, TAKE
THAT!







I'LL GET RID OF THIS ONLY AFTER FINDING THE RIGHT RECYCLING BIN.

NOW, URU, CAN YOU HELP ME TAKE THE TRACTOR UP TO THE RECYCLING BIN?

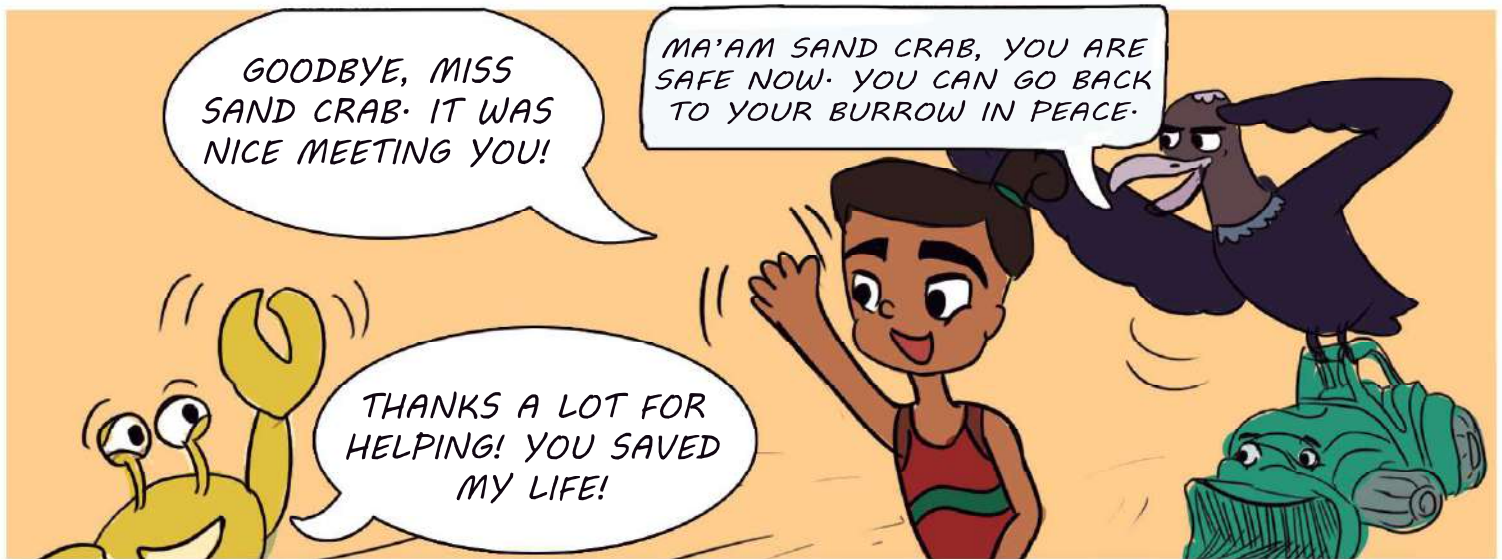
OK, I THINK SO.



COOL! SO WE MEET AT THE BINS.

AFFIRMATIVE, MARIANA.











OUCH!



WHAT WAS THAT ALL ABOUT?

URU, THIS ISN'T A GHOST!

IT'S A DEFLATED BALLOON!

BUT IT LOOKED SO MUCH LIKE IT...ERR WE THOUGHT IT WAS THE TWITCHING PUFFERFISH!

I ONLY TWITCH NOWADAYS, ALLRIGHT? ONCE I WAS GRACEFUL AND WILLOWY... MY FRIENDS AND I, WE WERE ALL SO COLORFUL AND BEAUTIFUL TOGETHER!

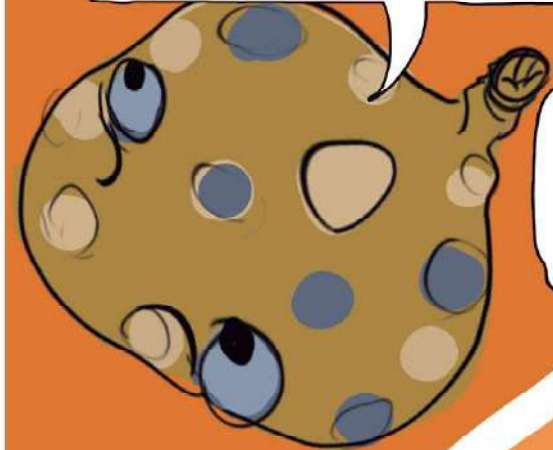
UNTIL THE DAY CAME, I WAS FINALLY SOLD TO A LITTLE GIRL. SHE SEEMED TO LIKE ME A LOT, BUT IN THE MOMENT AN ICEMAN SHOWED UP, SHE LET GO OFF ME... I WANDERED AROUND WITH THE WIND, AND THEN I STARTED DEFLATING...

I FELL INTO THE SAND AND THEN THIS VULTURE TRIED TO EAT ME. LUCKILY I WAS ABLE TO TIE UP ON ITS BEACK BEFORE GETTING SWALLOWED.

WOW, WHAT A DANGER! GOOD THING I DIDN'T SWALLOW A TWITCH...SORRY, BALLOON. I WAS SNOOPING INTO A CARCASS... IT WAS IN THE MIDDLE OF MY FOOD.

I AM VERY AFRAID OF THE GHOSTS FROM HERE, YOU KNOW? I WAS ATTACKED IN THE PAST AND I STILL HAVE THE SCARS. WHO MADE THIS WAS THE SHARPY GHOST THAT LIVES ON THE ROCKS AT THE END OF THE BEACH.

WELL, BALLOON, YOU LADY SHOULD GO TO THE BIN WITH US!







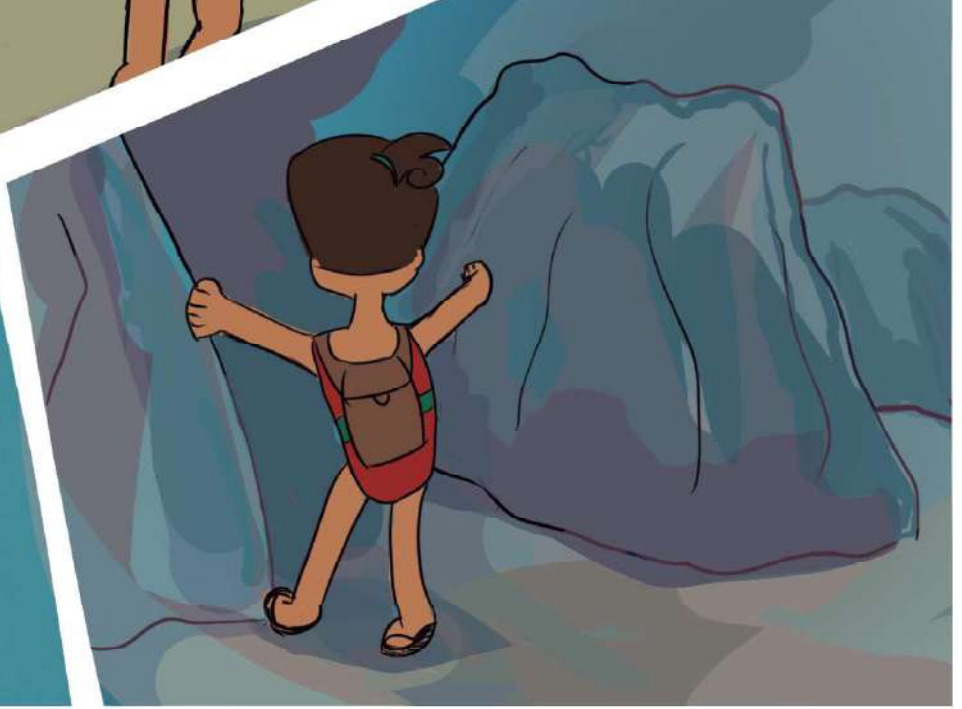


UFFH... THE BEACH'S
END IS SO FAR!

IT MUST BE HERE,
BETWEEN THESE
ROCKS.



I'LL GO THROUGH HERE.

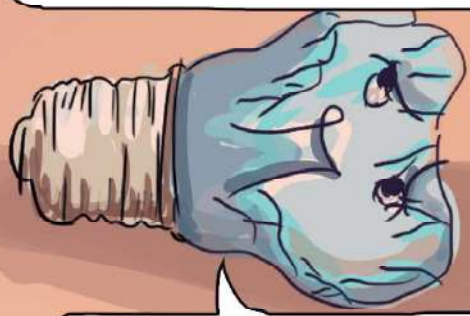




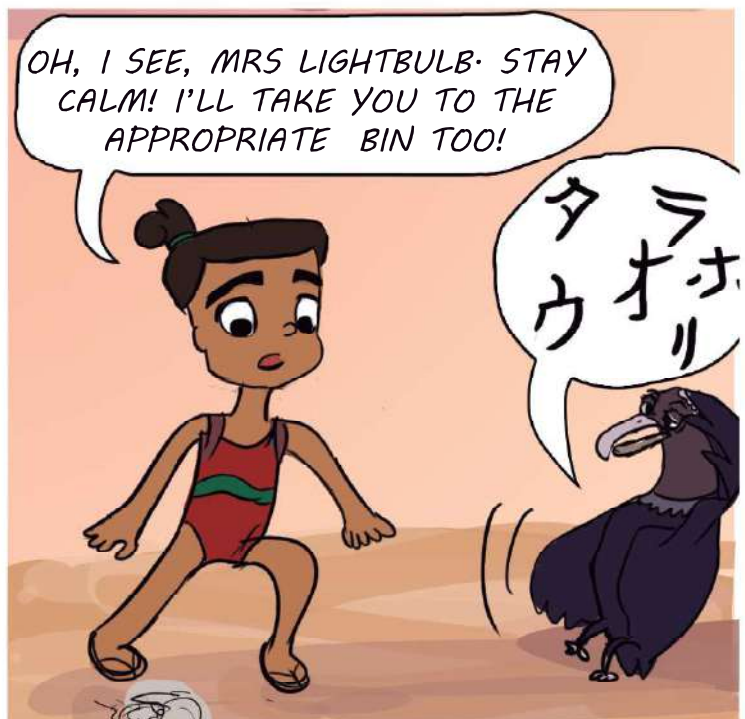


OH GOD! URU! HAVE YOU TRIED TO SAVE ME? HAVE YOU HURT YOURSELF?

HEY , GIRL, WATCH OUT! DON'T STEP ON ME! I AM SORRY, I DIDN'T WANT TO ATTACK ANYONE. I'VE BEEN STUCK IN THIS CRACK FOR AGES.



I USED TO LIGHT UP A HOUSE NEARBY, UNTIL THE HOUSE' OWNERS DECIDED TO REDECORATE THE PLACE. THEY CHANGED ALL THE LIGHTBULBS...THE ONLY THING THEY DIDN'T WORRY ABOUT WAS DISCARDING US CORRECTLY...THEY PUT US ON THE STREET ON A RAINY DAY AND THE WATER DRAGGED ME HERE.



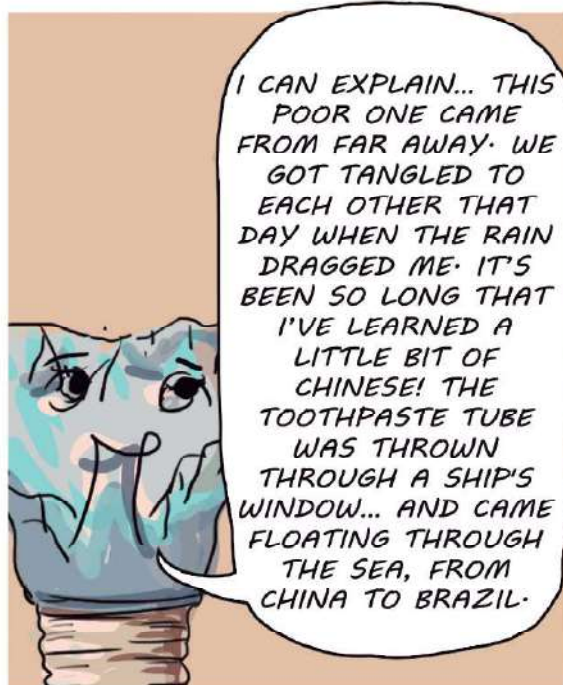
OH, I SEE, MRS LIGHTBULB. STAY CALM! I'LL TAKE YOU TO THE APPROPRIATE BIN TOO!

ラホリ
タウ
ウ



URU, ARE YOU OKAY? DID YOU SPEAK IN CHINESE??

ANNH...IT WASN'T ME...





ALL ABOARD, PLEASE. THIS BAG IS GETTING FULL ALREADY. WE NEED TO GET TO THE RECYCLING BINS AS SOON AS POSSIBLE.



AND HURRY UP, THE TIDE HAS RISEN.



AAAH, URU?? WHERE ARE YOU??!



HELP ME, MARIANA!!!
IT IS ONE OF THE GHOSTS! IT CAUGHT ME!!!



URUUU, NOOO!



SPLASH









COUGH,
COUGH.



URU,
BREATHE,
PLEASE!



WE'RE SAFE.
CAN YOU TALK
TO ME?



Ahhhh...



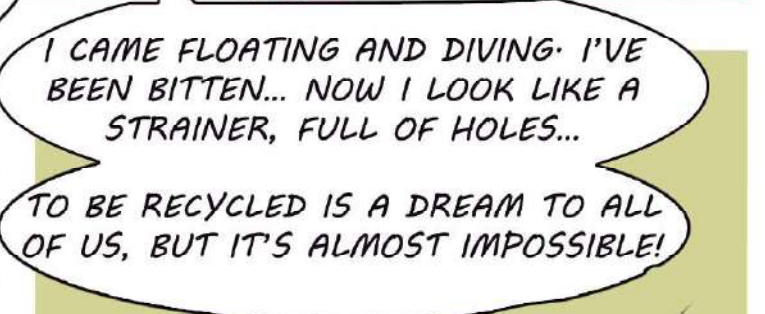
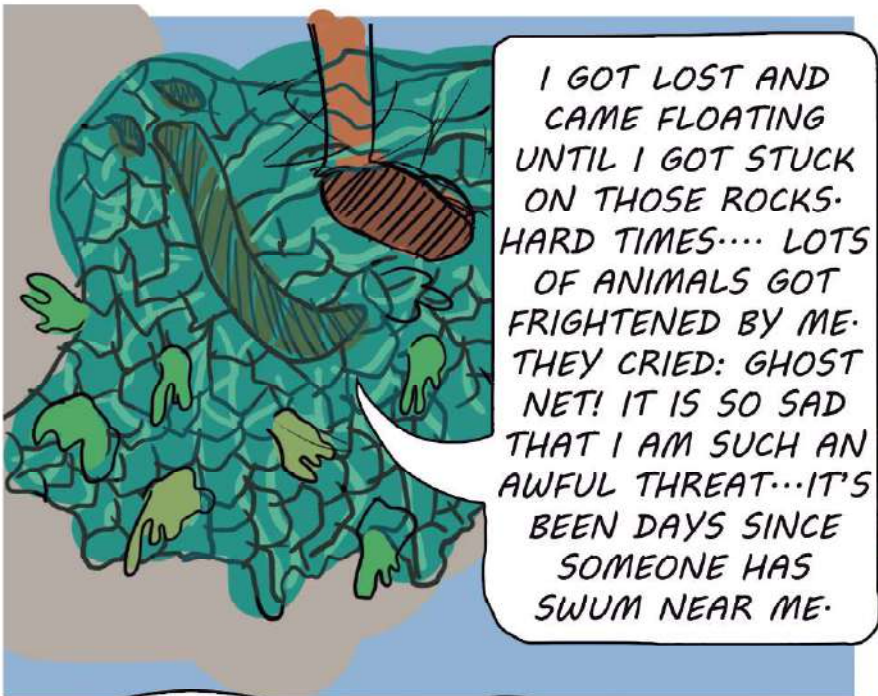
MARIANA... THE GHOST...
RIGHT BEHIND YOU...



CRACK

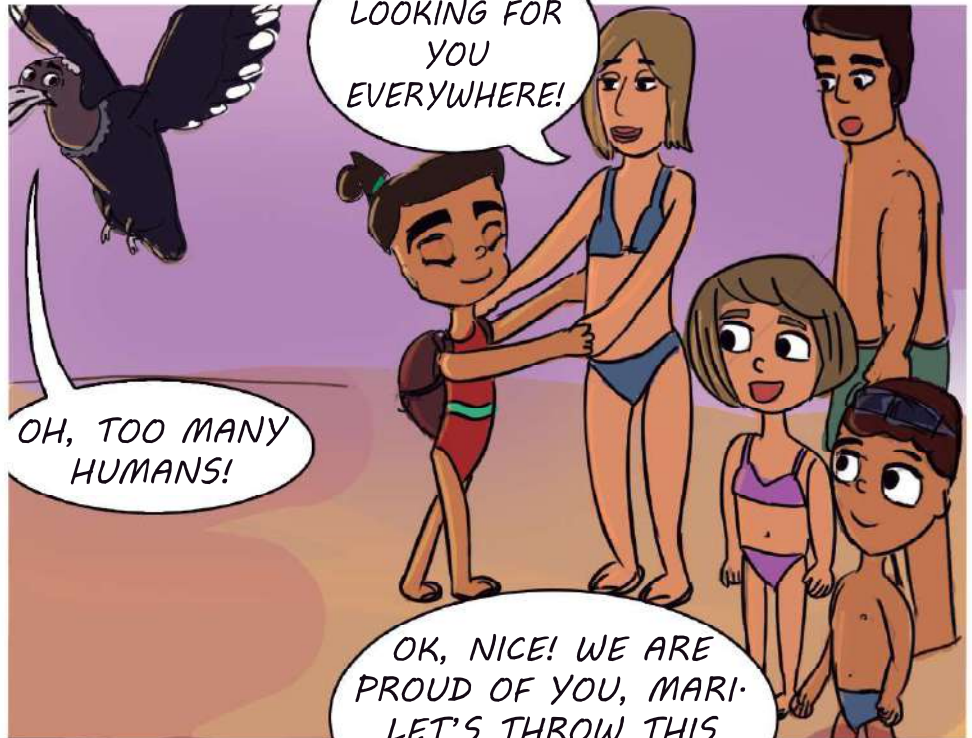


CALM DOWN!... SORRY I'VE
ALMOST DROWNED YOU, LITTLE
GIRL! I KNOW IT LOOKS LIKE IT,
BUT I'M NOT A GHOST. I AM
JUST A LOST FISHING NET.



URU, ARE YOU FEELING BETTER? I HAVE TO GO...MY FAMILY MUST BE WORRIED.







HEY, URU, YOU DON'T NEED TO BE AFRAID! COME CLOSER.



THANK YOU FOR EVERYTHING, HUMAN GIRL, YOU SAVED MANY LIVES HERE TODAY!

I WILL BE ALWAYS FLYING AROUND, MARY.

YOU ARE WELCOME, MY FRIEND. TAKE CARE, PLEASE! I'M GONNA MISS YOU!



AND THAT'S ALL MATES! THIS STORY CONTINUES WITH YOU TOO! LET'S HELP TO KEEP OUR BEACHES CLEANER EVERY DAY!

THE END

This is Mariana

This is Mariana! In 2016, when she was 5 years old, Mari and her dad got to know the "Understand the Debris" Program, which is an awareness-raising strategy. After learning more about the topic which already called their attention, dad and daughter organized a cleanup event putting into action a family dream, a project called "Viva Mariana" ("Live, Mariana" Project).



Apart from recovering items we find on streets, at rivers, beaches and seas, what else can we do to decrease the amount of debris in the environment?



And it is also nice to remember that rubbish is a material that cannot be used anymore at all! That is why we should treat this as a used material, that can have other destinies.

About the animals



Photo: Monique Rached

Popular name: Vulture

Scientific name: *Coragyps atratus*

Diet: Eat dead animals (sacrophagus)

Habitat: low vegetated and urban areas

Global distribution: American continent

Curiosity: these birds do not present feathers on their heads and necks, which facilitates feeding carcasses and preventing diseases

Popular name: Crab

Scientific name: *Ocypode quadrata*

Diet: Varies – insects, small crustaceans and organic matter derived from plants

Habitat: sandy beaches or estuaries

Global distribution: Ocidental Atlantic Ocean, from Rhode Island in the United States down to Rio Grande do Sul in Brazil.

Curiosity: their colour changes a lot while the animals grow



Photo: EnTenda o Lixo



Photo: EnTenda o Lixo

Popular name: Green Turtle

Scientific name: *Chelonia mydas*

Diet: Varies from omnivore when a hatchling to herbivore when adult

Habitat: coastal waters, islands or bays, with a lot of algae

Global distribution: tropical and subtropical waters

Curiosity: for every 1000 born hatchlings, only 1 or 2 reach adulthood

In real life



These are some of the items that inspired our story, all of them found in Brazilian beaches. Did you know that plastic is the most common material found amongst the debris in the marine environment? Because of its high durability and floatability, plastic objects are usually taken to the coastal regions. However, there are other materials that comprise what we see at beaches. What other types of waste can we find?

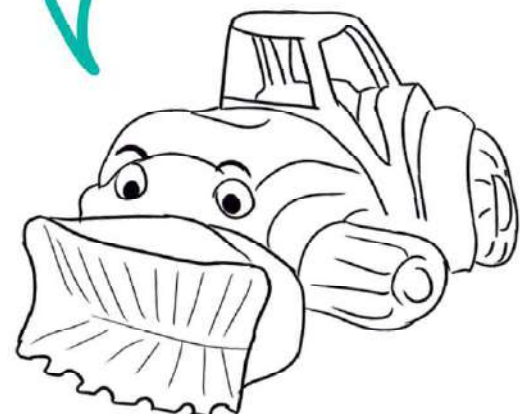


Photo: EnTenda o Lixo



In other cases the materials arrive at the beach in small sizes. Fibers are eliminated during the washing process of synthetic cloathing, for example. And we cannot forget microbeads from health care products such as some toothpastes, and exfoliant soaps.

Did you know that some materials break into tiny pieces and can be ingested by marine animals? With time it gets harder and harder to recover this material/take this material out of the sea!

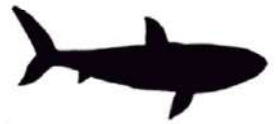


Net-Words

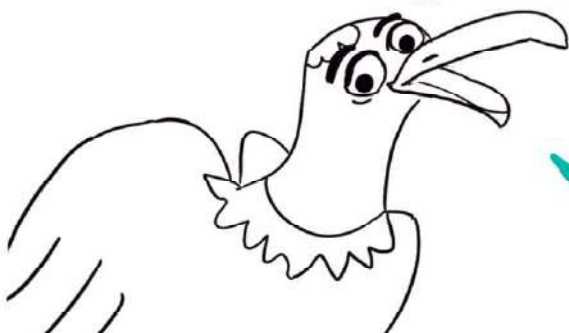
Help Mariana finding the turtle! Which other marine organisms can you find?



S	T	Y	R	O	F	O	A	M	N	U	N
S	H	A	R	K	C	A	T	H	P	S	O
S	A	C	E	B	E	T	F	K	F	C	Y
O	R	D	V	C	E	O	O	C	A	A	J
D	Y	I	S	T	R	T	T	P	T	A	E
L	M	A	U	K	Y	A	B	R	U	D	L
A	R	L	R	C	I	A	B	A	P	S	L
H	T	U	R	T	L	E	T	A	N	G	Y
B	O	T	T	L	E	H	L	L	G	I	F
D	T	E	O	C	T	G	W	B	H	A	I
A	U	O	T	Y	A	L	E	O	P	O	S
N	N	R	R	E	T	N	O	E	T	A	H

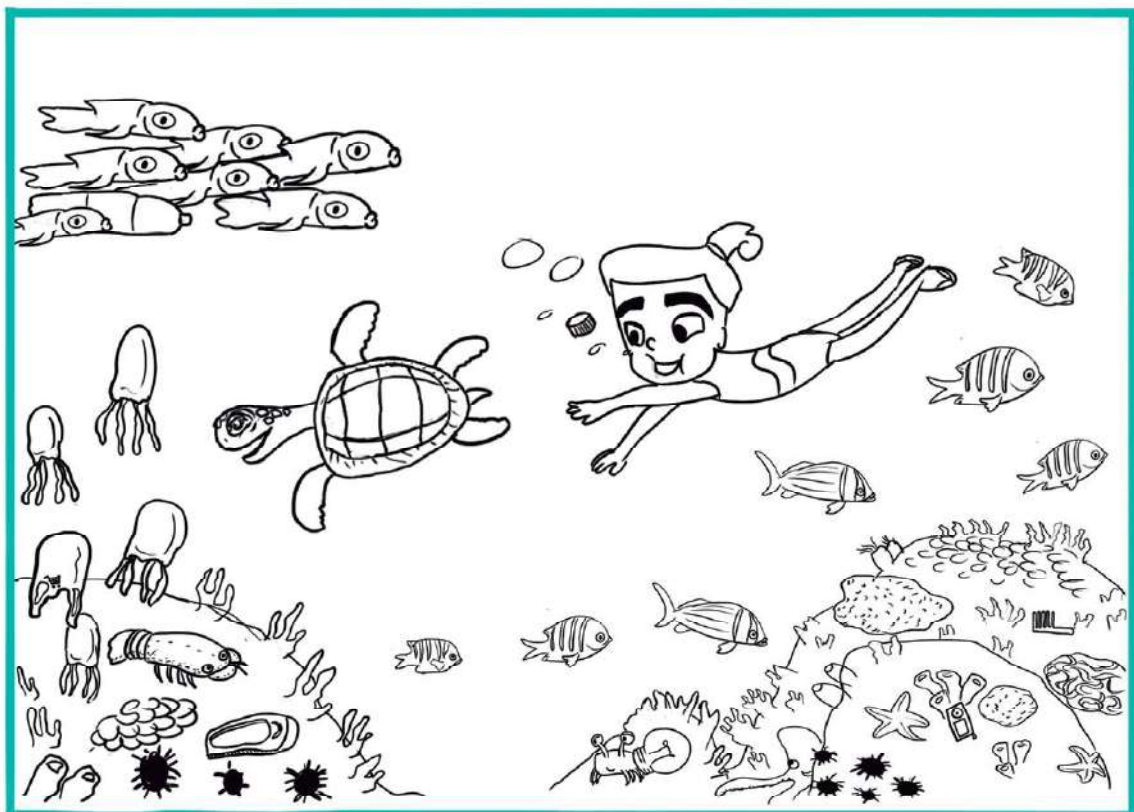


Hey, could you find anything else that should not be at sea? Write here!



For how long might these items rest in the oceans if you hadn't found them?

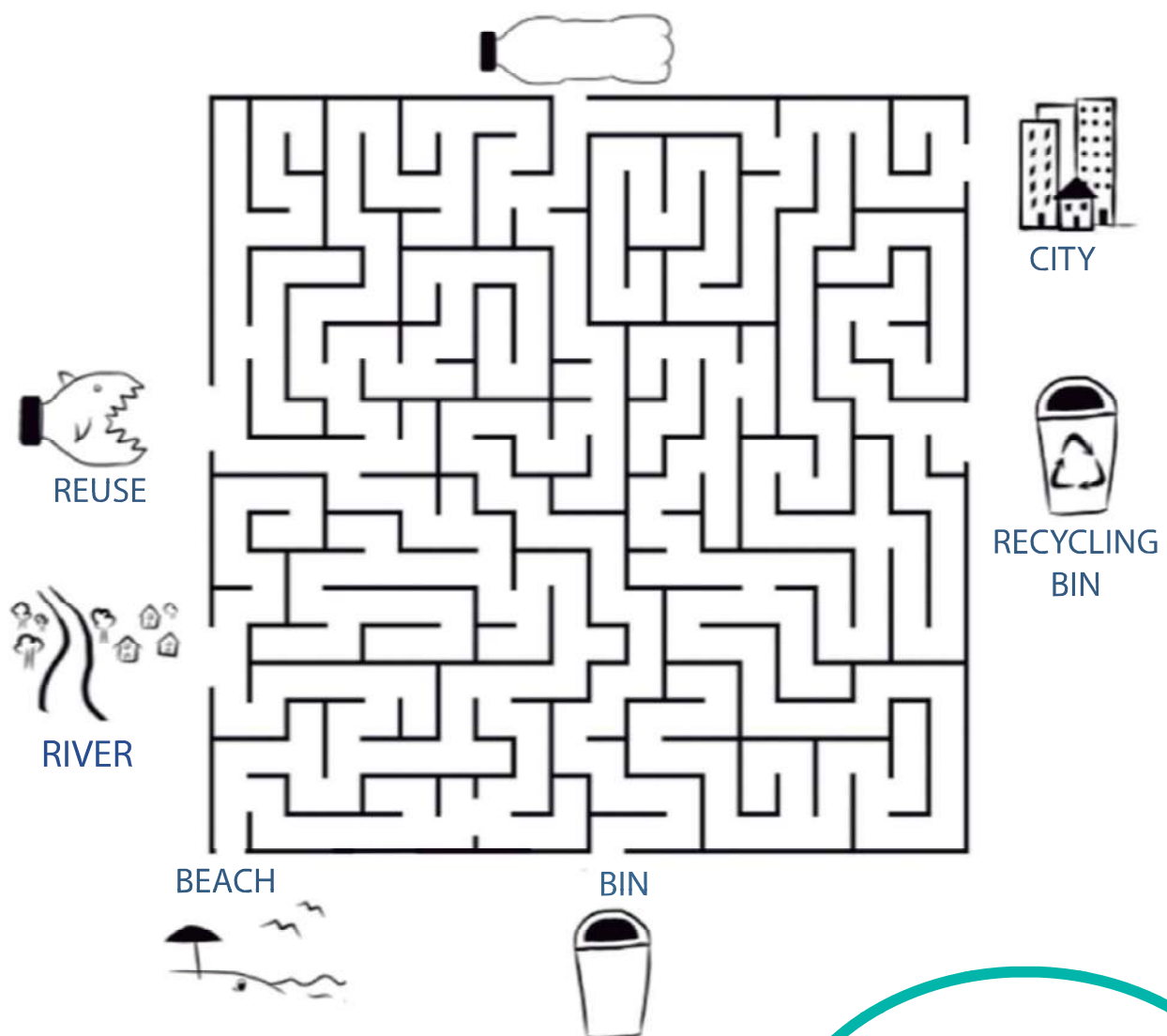
There is litter on the bottom?



Did you know that scientists have found litter on the Mariana's Abyss (Japan, 10.898m deep)? This is the deepest place in the oceans!

Where should the litter be thrown?

Nowadays we buy many things that sometimes we don't even need! Before buying any product, we must always rethink if it is really necessary. In case it is, we have a few options to deal with the materials that will not be used the same way again. Try to find different options of paths! Beware not to take this bottle to the wrong spot.



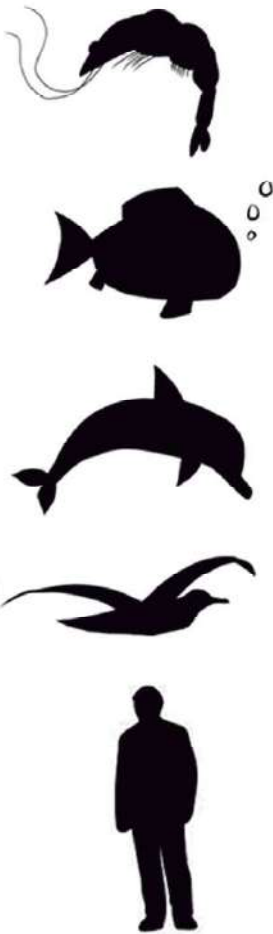
In the oceans there are large areas with floating debris! Can you imagine your house full of trash?



Even though the last option is to dispose the material in a regular bin, at least it is a way to make sure that your litter will not end up in the sea. Refuse, reduce, reuse and separate for recycling!

What are the problems caused by marine debris?

Link the animals to the impact(s) marine litter can cause at sea (remember, one animal can be exposed to more than one impact).



Can starve because of a fishing line around the mouth

Can lose quality of life

Can ingest the litter as if it was food

Can get hurt with broken glass

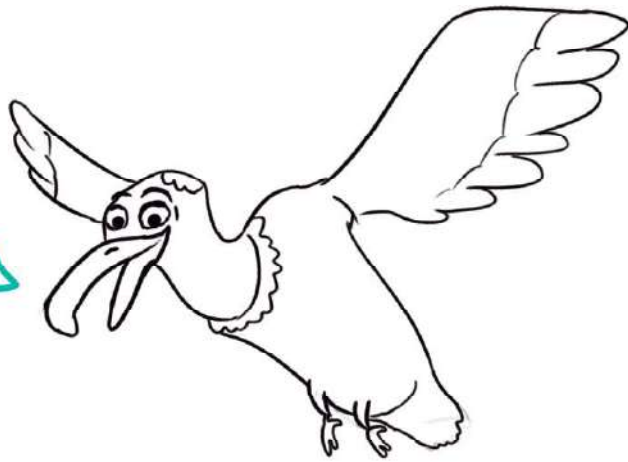
Can be entangled in a fishing net

Did you know that even the tiny zooplankton ingest small debris particles?

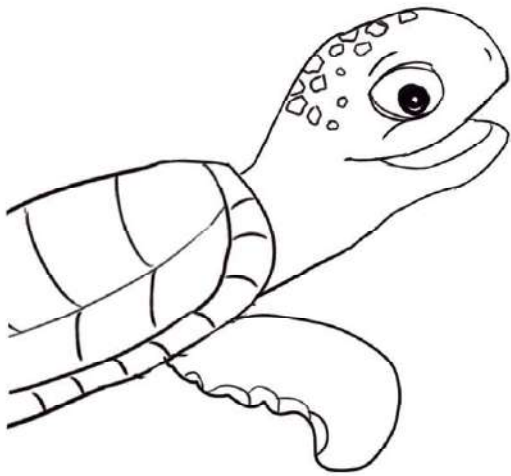


What can we do to avoid marine debris?

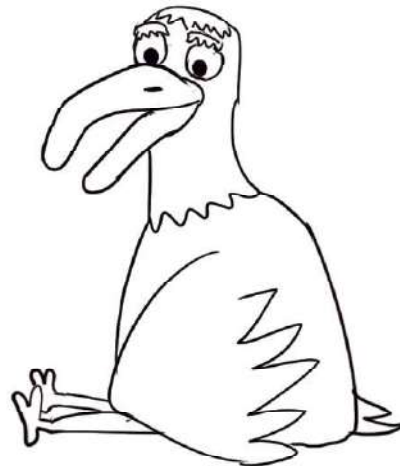
What are the daily habits you can change in order to contribute?



It is important to remember that there is no "throwing out", because there is no "outside". The planet is one interconnected system, and if your waste is not recycled, it will accumulate somewhere else in the planet... as trash or as smoke and dust.



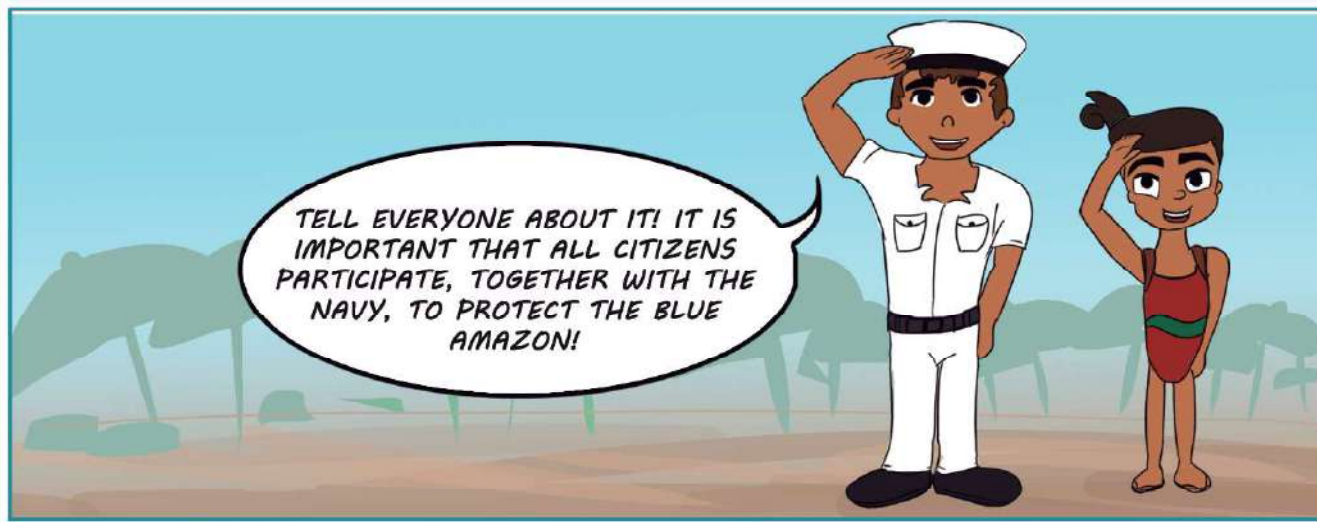
Separating your waste and taking it to be recycled is a good idea! That's the way we guarantee a happy ending to the waste we generate!



Therefore, the best solution of all is to think about the use of each material... this or that, do I really need it? The reduction of waste generation starts with you!



Mariana meets Normarzinho, Petty Officer of the Brazilian Navy



What is the Blue Amazon?

In November 16th, in Brazil, we celebrate the National Day of the Blue Amazon. The goal is to raise the awareness of the population towards this enormous oceanic territory.

Brazil has a vast maritime area under national jurisdiction with an unquestionable importance. Apart from influencing the Brazilian weather, the Blue Amazon embraces national oil and gas reservoirs, it is the main economic route from the country to the rest of the world, and it contains a great diversity of natural resources such as fishing stock, marine biotechnology and mineral resources. Due to representing the equivalent of 52% of Brazil's terrestrial area, with dimensions and biodiversity similar to that of the Amazon forest, it was agreed that this marine area should be called the Blue Amazon. With that, the Brazilian territory corresponds to 12.951.766 km². What about your country, do you have an oceanic territory?



Legend

Territory
Area: 8.500.000 km²

Territorial Sea:
it extends up to 12 nautical miles away from the coast line

Economic Exclusive Zone (EEZ) Area: 3.500.000 km², extends up to 200 nautical miles away from the coast line

Continental Shelf extension : area 2.100.000km²

EEZ + Continental Shelf = Blue Amazon Area: 5.700.000 km²

A little bit more information

Brazilian National Continental Shelf Survey Plan

The Brazilian National Continental Shelf Survey Plan is working towards defining the external limit of the Brazilian Continental Shelf, beyond the 200 nautical miles (Economic Exclusive Zone), in which Brazil will have full sovereignty to exploit the natural resources of the marine bottom and underground. The study of the external limit of the Brazilian Continental Shelf was forwarded to the UN in order to increase 960.000 km² into Brazilian territory, that summed up with the 3.500.000 km² of the EEZ, will guarantee a total maritime area of 4,5 millions km², enlarging the Blue Amazon.

Mineral Resources

The Brazilian sea, apart from oil and gas, keeps many other reservoirs of non-living resources that represent an important source of wealth to the country, such as salt, sand, gravel, phosphorites, cobalt crusts, sulfide and polymetallic nodules.

Marine Biotechnology

The ocean contains a great variety of marine organisms with biotechnological value, that have properties which can be applied in numerous contexts such as pharmaceuticals, cosmetics, food supply and agriculture. Brazil has been stimulating the development and innovation in the diverse areas of Marine Sciences, aiming to transform the rich biodiversity into products.

Do you want to know more about marine debris?

There are different institutions in Brazil that work with awareness-raising about the problems caused by marine debris! One example is the Brazilian Network Against Marine Debris, organized by UN Environment of Brazil and Instituto Ecosurf, network in which we can find where in Brazil these institutions are! Where can you find activities like that in your country? Have you ever been on a CleanUp? What was the weirdest item you've encountered?

Access and check: <http://bit.ly/MapaPraiaLimpa>

Other comic books of the Blue Amazon Collection:



"Blue Amazon Booklet"

"Atobaldo and friends in: The São Pedro and São Paulo Archipelago"

"Proantar: Brazil in Antarctica"

"Trindade Island and Martin Vaz Archipelago - the story of where the sun first reaches Brazil"

These and other publications are available (in portuguese) for download in: www.marinha.mil.br/secirm/publicacoes

Unscrambling

Where do marine debris come from? Beware, the letters are scrambled! Afterwards, answer the question!

TYCI

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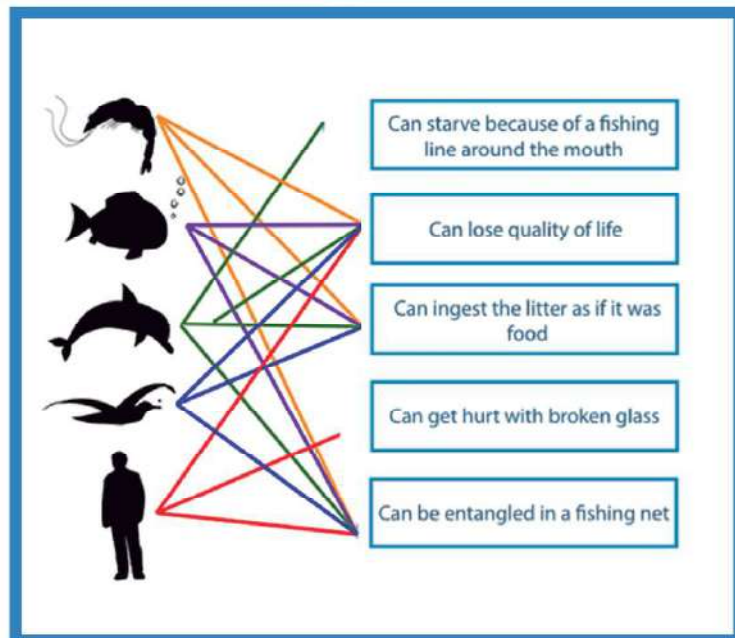
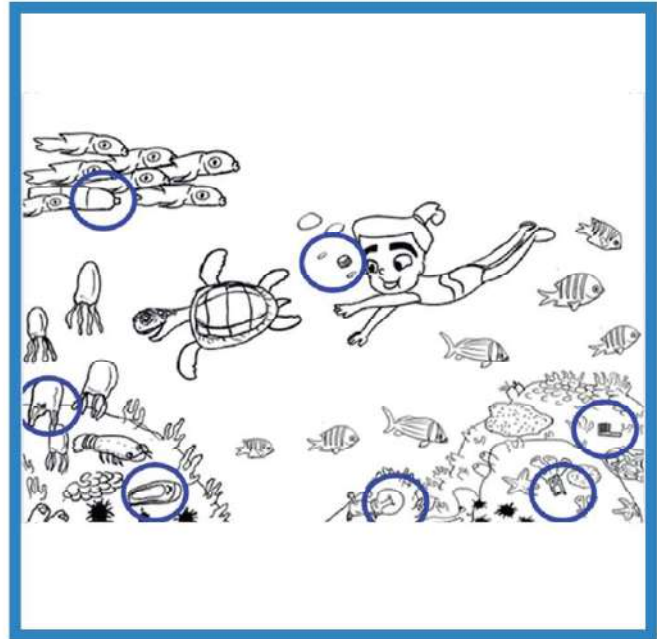
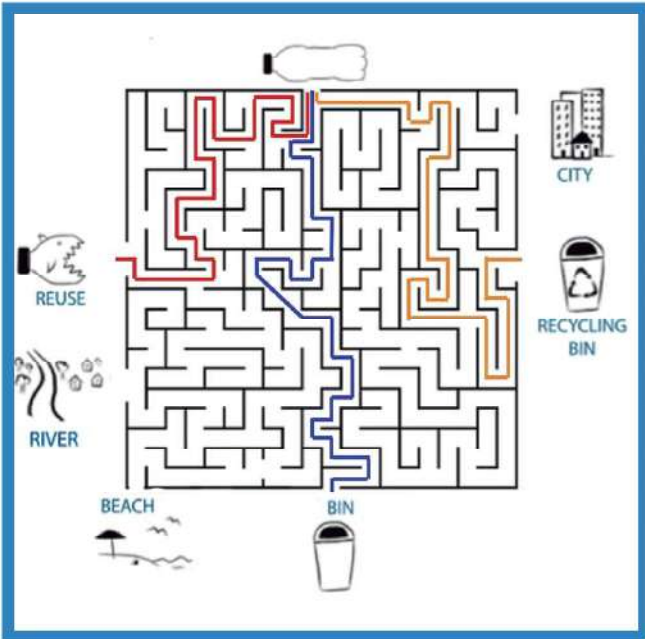
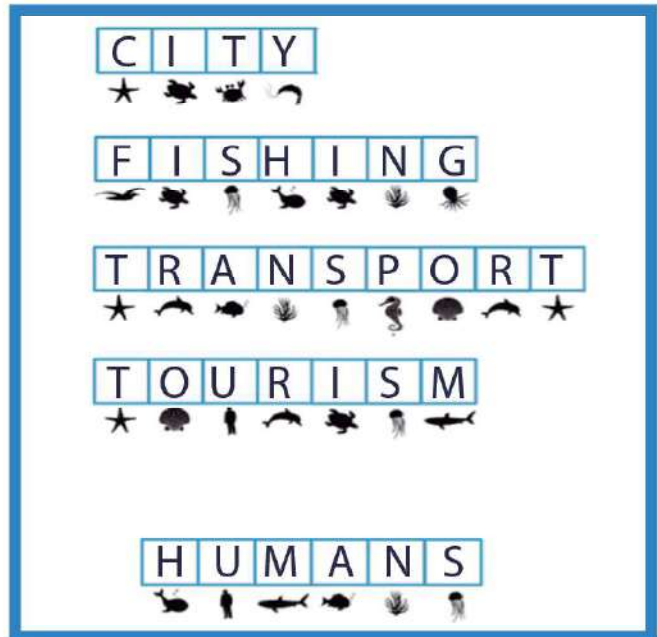
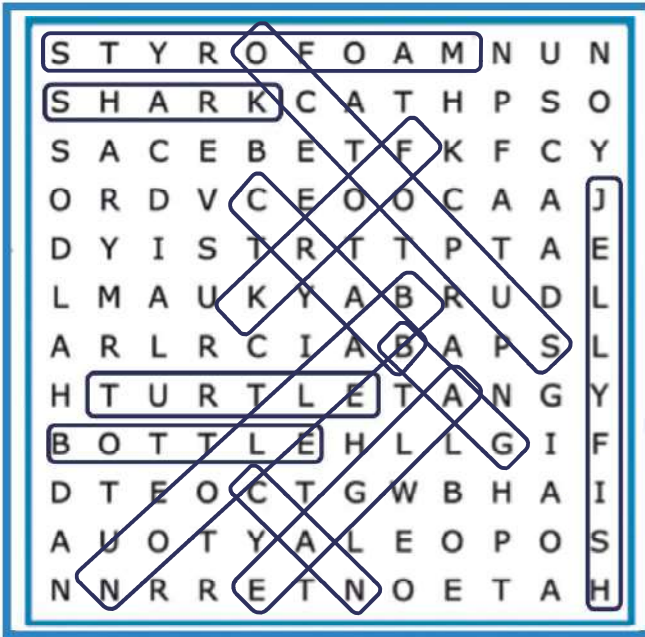
Cool! Now that you have figured out some possible sources of marine debris, answer: **Who is responsible for them?**

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Did you know that 8 of every 10 items that we find at sea come from land activities? We need to make sure that no material we generate arrives into the ocean!

ANSWERS





The preparation of this booklet was an integral part of Monique Rached's course completion work in the Specialization Course in Scientific Journalism offered by the Laboratory of Advanced Studies in Journalism, UNICAMP.



entendaolixo@gmail.com



[@entendaolixo](https://www.instagram.com/entendaolixo)



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UNESCO Chair on Ocean Sustainability
University of São Paulo
Established in 2018

