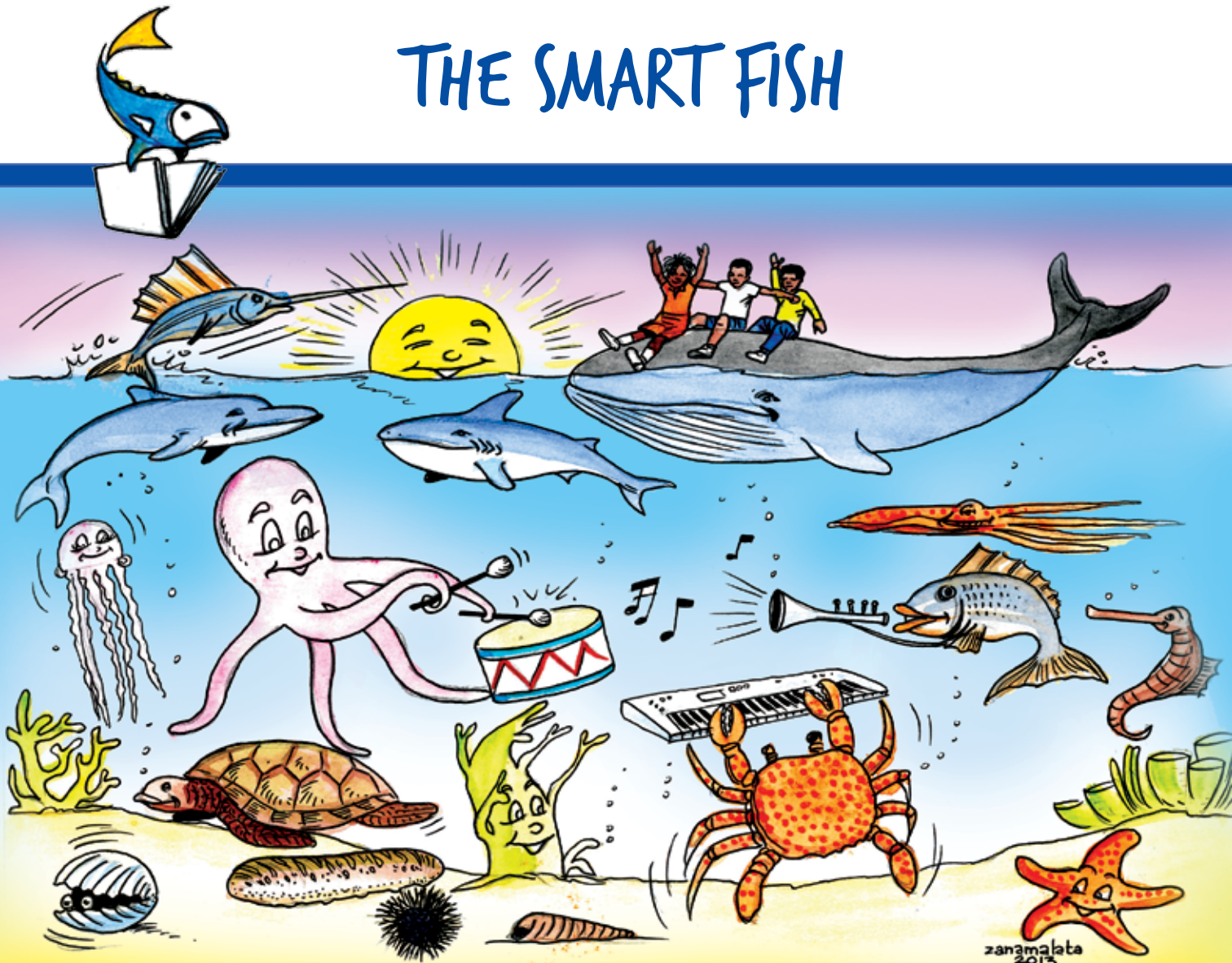


THE SMART FISH



zanamalata
2013

A STORY AND SOME GAMES

CREDITS

Concept and scénario : Nelly Ardill

Research and realization : Maya de Salle-Essoo


Illustrations : Pierre Rajaonarison

Graphic design : Shirley Chan

Technical supervision : Clotilde Bodiguel et Florence Wallemacq

CONTACT

Florence Wallemacq, Coordination Officer, Florence.wallemacq@fao.org



Dear Marine world friends,

The seas and oceans that surround us as well as the creatures crawling within it are treasures that we need to protect. Keeping our marine environment in good shape is essential for us and for our survival. Our families, our friends as well as past and future generations will rely on it to live.

The activity book you hold in your hands is an invitation to discover and play with this mysterious and unique aquatic world. The activities will help you to find ways to protect it on a daily basis.

I hope you had fun with the puppets Shirley, Sam, Angela, Pr Artik and Liv. I would like you to continue having fun by submerging your mind in the book in front of you.

Let's meet again soon either on the beach, in the sea or in mangroves to take action and protect our blue planet.

Clotilde Bodiguel
FAO Project manager
SmartFish programme

How to use this guide?

The solutions of the games and activities are at the end of the guide. If you do not understand all the words, do not hesitate to ask for help from your parents, your brothers and sisters, your teacher, or the fishers...

Drawing sheets and a world map are at the end of the guide.

Glossary

Biodiversity

It is all that lives on Earth: animals, plants, people, etc.

Food chain

Every animal eats another animal, which eats another one, which eats another one and so on. Small fish eat seaweed, medium fish eat small fish, big fish eat medium-sized fish, and finally people eat big fish. This series of living beings in which each one eats the next one forms a chain.

Deforestation

Destroying a forest, cutting down all the trees, including plants that live in water, such as mangroves.

Sustainable development

Men's actions must respect the earth, the sea and all living species so that they last very long.

Ecosystem

Living beings and their relationships with each other and with the place in which they live.

Erosion

The deterioration of land and rocks by wind or water.

Pollution

Make a place dirty or fill it with waste from bins or factories, with chemicals, or with water that can make you sick.

Coral reef

The reef that protects the lagoon and the coast from big waves that could destroy all the inhabitants of the coast.

Overfishing

It is fishing too much in one place or fishing the same species without stopping.



THE SEA IS ANGRY: BIODIVERSITY IS THREATENED.

Pollution is on the beach, people have cut mangroves, corals have been destroyed and are bleached, there are oil spills, fish choke and die, they are hungry, and biodiversity is in danger!



You too are in danger because **biodiversity** is threatened!
We are part of biodiversity. There are different aquatic **ecosystems** (mangroves, lagoon, high seas, and wetlands) where there are many living beings.

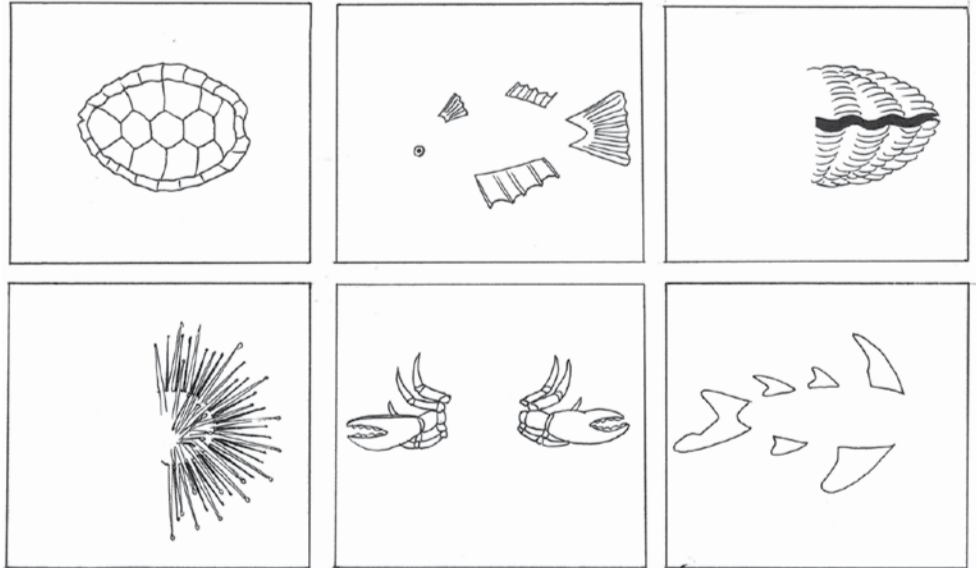


what would the Earth complain about if she were angry?
 what would she do?
 on a white sheet in your notebook, draw an angry Earth.



Observation

Complete the drawing to find out which animal is drawn and give its name.



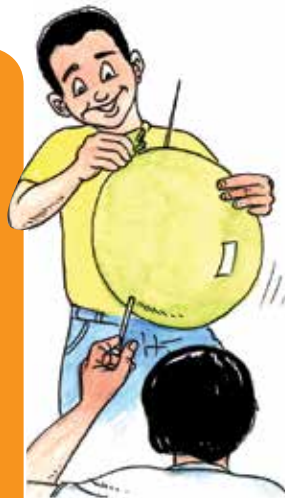
- Color the dangerous ones in red.
- Color the weapons they use to defend themselves.
- Which of these animals have teeth?

Appicascience

Balloon Fakir

Equipment: 2 balloons, 1 sharp stick (wooden, like a skewer, a toothpick), dishwashing liquid or oil.

Inflate the 2 balloons and tie them with a knot. Try to pierce a balloon with the sharp stick. It explodes! Now dip the stick in dishwashing liquid and try to push your stick where the rubber is thicker and darker, while turning the stick slowly. The balloon does not explode! This is because you pierce the balloon where its membrane is less tense and the dishwashing liquid helps to pierce the membrane without tearing it. The air escapes, but more slowly



Do you know?

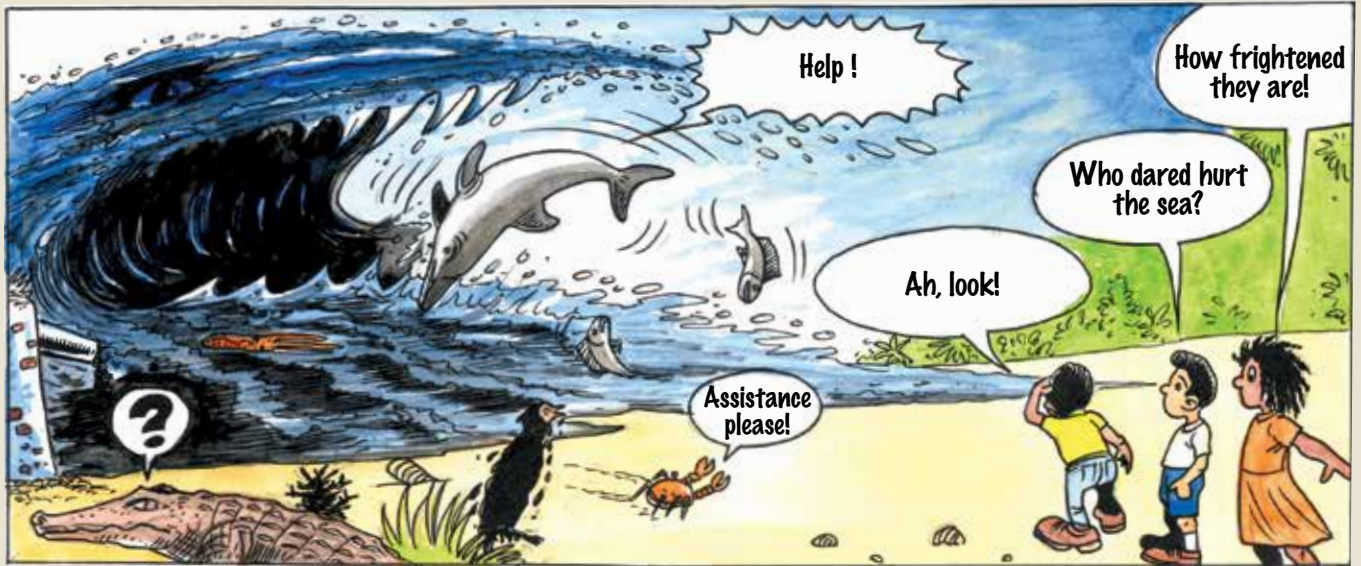
To protect itself, a land turtle sticks its head and legs into its shell. A sea turtle cannot do this.

Do you know why?



HELP !

The whole food chain will be broken if ecosystems and biodiversity are destroyed.



Each species is a **predator** for another one, that is to say an animal depends on its food to survive. Relationships between predators and their **prey** form a chain, called the **food chain**. If this chain is broken, the whole **ecosystem** is affected.





what would happen if there were no more small fish?

Observation
By drawing an arrow between them, classify the species to form a food chain.



Applicascience

Flower vacuum cleaner

Equipment: 2 white flowers, 2 glasses of water, color (ink, linen blue, mercurochrome, etc.).

Put water and a white flower in a glass. Put another white flower in another glass without water, and pour in a color. Wait a few hours and observe. What has happened? The color of the flower in the second glass has changed!

Do you know?

Like algae, flower sucks the product you put in the water. If an alga sucks chemicals, it becomes harmful for whoever eats it and will poison the entire food chain.

ECO-LOGIC

Complete the logical sequence



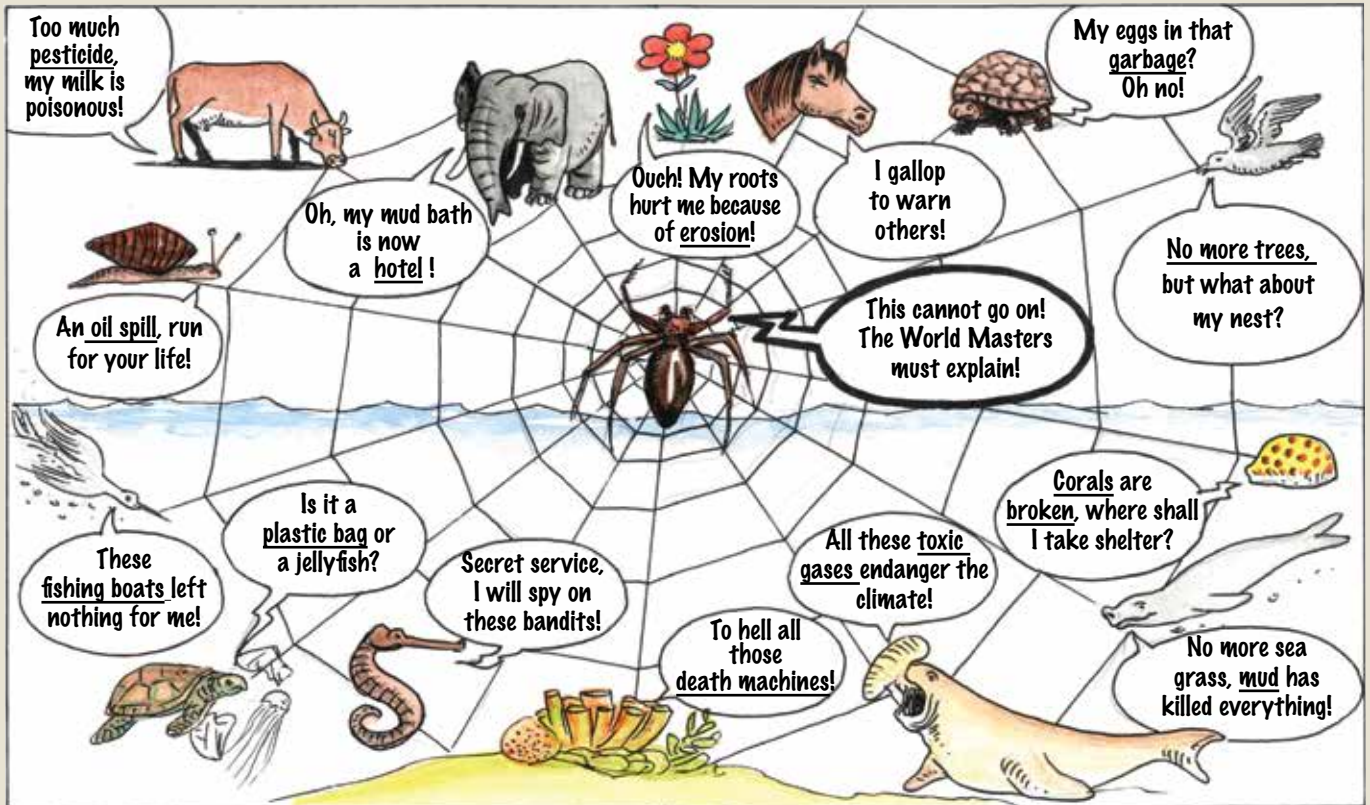
5 - 7 - 10 - 14 - ...

Careful, there are two solutions for the latter !

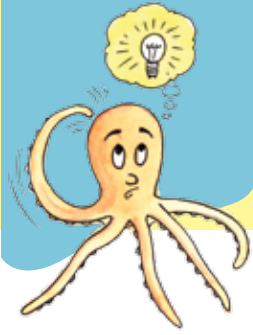


WHOSE FAULT IS IT?

Meanwhile, a sea animal talks to a land animal. What do they say?



Thoughtless **human** actions threaten ecosystems.



DO YOU KNOW THE NAME OF ALL THE ANIMALS IN THE PICTURE? (page 9)

- Which one is the intruder that does not live in the area?
- OF WHAT DO THE UNDERLINED WORDS REMIND YOU?



Deforestation

River pollution

Marine pollution

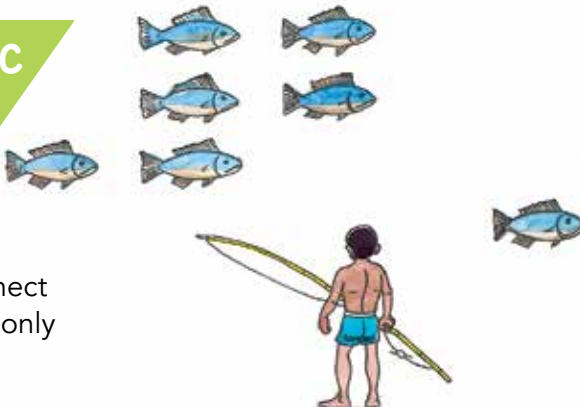
Polluting factory

Observation

Identify sources of ecosystem destruction in the picture and place labels in the right place.

Have you ever observed such phenomena near your home?

ECO-LOGIC



How can we connect all those fish with only 3 lines?

Magic

THE SLIMY FISH

Equipment:

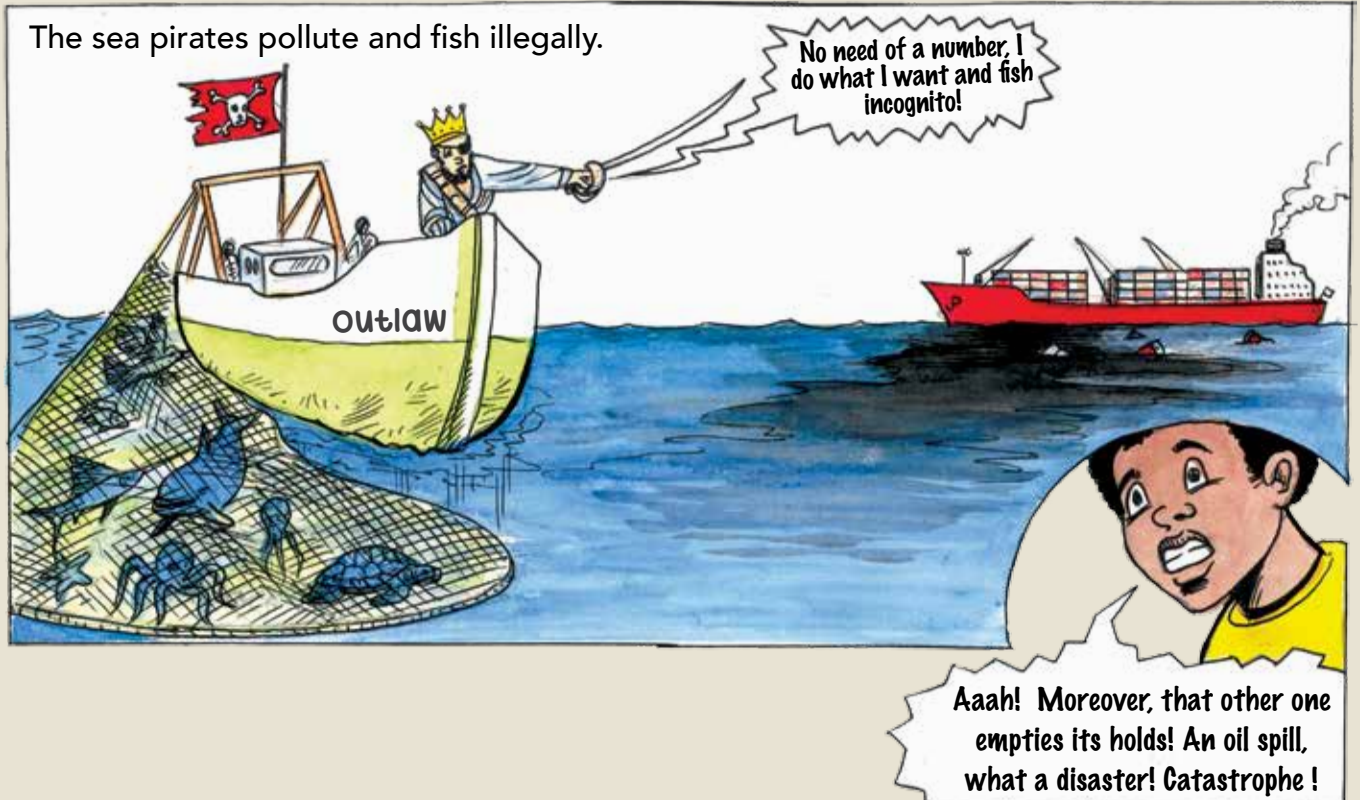
A sheet of paper.

Take a sheet of paper in one hand; hold it up to your head. Let it go and ask someone else to catch it. You will see that it is impossible for someone other than you to catch this fish.



WORLD MASTERS SUMMIT MEETING.

The children visit the World Masters to ask for help. However, the World Masters do not have the right solutions; on the contrary, they are rather masters of disaster !



Sea pollution (emptying fuel tanks, oil spills), illegal fishing and destructive fishing techniques (destructive trawls, dynamite fishing) threaten biodiversity and ecosystems.



Fishing with gear that destroys the seabed, fishing with dynamite that breaks corals, fishing without license and spill oil in the sea, all these are bad practices. What other bad practices do you know in everyday life?



Observation

HUNTING FOR WASTE

Look at the picture and encircle those objects that pollute the lagoon.

Applicascience

The stretchable sheet

How to get your head through a sheet of your notebook?

Matériel : 1 feuille, des ciseaux

1. Take a sheet from your notebook; fold it in two, then in four.
2. With scissors, cut the sheet folded in two along the fold, stopping at 2 cm from the edge.
3. Fold it again into four and on the larger side, make 4 spaced cuts, stopping at 2 cm from the edge.
4. Turn the paper over and make 5 notches on the other side, always stopping at 2 cm from the edge.
5. Unfold the sheet you can get through it!



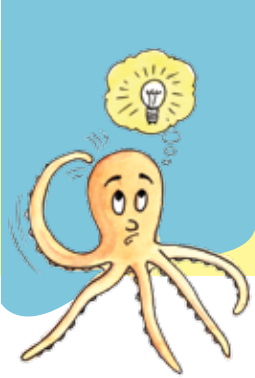


WORLD MASTERS SUMMIT MEETING.

The World Master GMO, Grand Master Ô, destroys the reefs and life in the lagoon with toxic products.



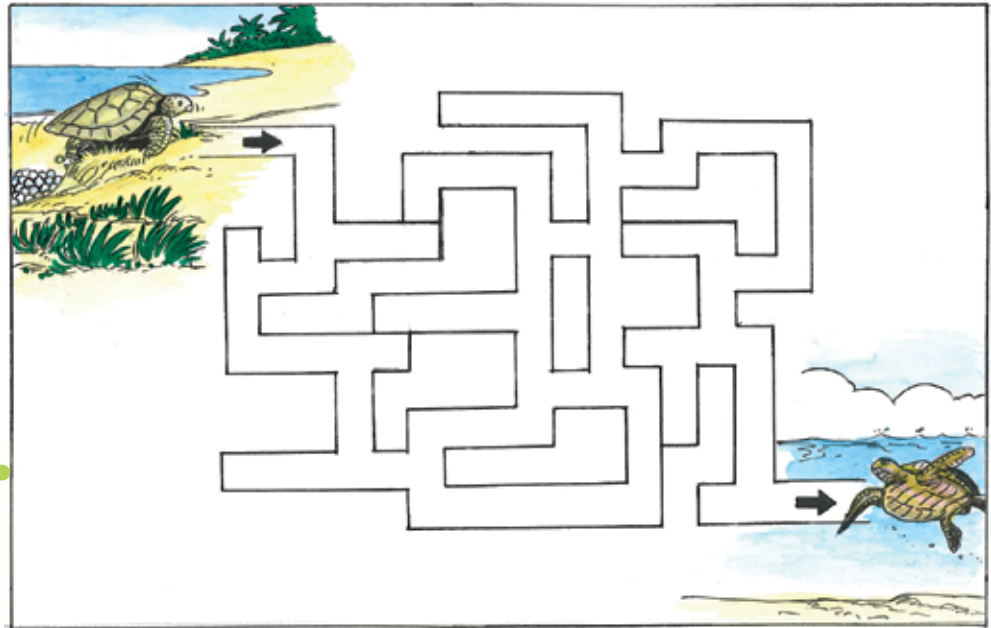
Lagoons are valuable for men and for creatures of the sea. Corals and mangroves provide shelter to most of our resources. In addition, reefs protect us from natural disasters. It is important to protect them.



Fertilizers and pesticides used in the fields pollute the lagoon. Just like wastewater from hotels or factories. How is this possible?

ECO-LOGIC

Help the turtle who laid her eggs on the beach to find its way to the sea.



Applicascience

The cupping-glass

Equipment: a glass of water and a sheet of paper.

Fill the glass with water to the brim. Place the paper flat on it, put your hand on the paper, and quickly turn the glass upside down. Gently remove your hand.

Wow! The paper sticks and water does not flow!



Connect each animal to its attributes:

The whale	has 3 rows of teeth
The shark	has fins
The coral	has scales
The fish	is made up of polyps
The crocodile	has vents



WORLD MASTERS SUMMIT MEETING.

Master Agogo questions Sindrome, the genie of the magic lamp, so that the resources he fishes be an inexhaustible treasure.



Overfishing means too much fishing of a particular **species** that has no more time to **reproduce**. We must not **fish** just about anything, anytime and anyhow.



marine resources are increasingly scarce and there are more people to feed. If you fish too much of the same species in the same place, this species could disappear. Why is it so, in your opinion?

Brainstorming : Is this reasonable?



Shrimps are caught off Madagascar; they are cleaned, shelled, and frozen bulk in Tanzania. They are then shipped to London for certification and packed in boxes, before being sent to Mauritius for sale in the shop. Using the specified distances, calculate how many kilometers these shrimp have travelled before arriving in the store near your friend in Mauritius?

Madagascar > Mauritius : 1,058 Km

Madagascar > Tanzania : 2,110 Km

Tanzania > London : 7,198 Km

Tanzania > Mauritius : 2,956 Km

London > Mauritius : 9,954 Km

London > Madagascar : 9,291 Km

To help you, there is a map on the page 36

EASY QUESTIONS

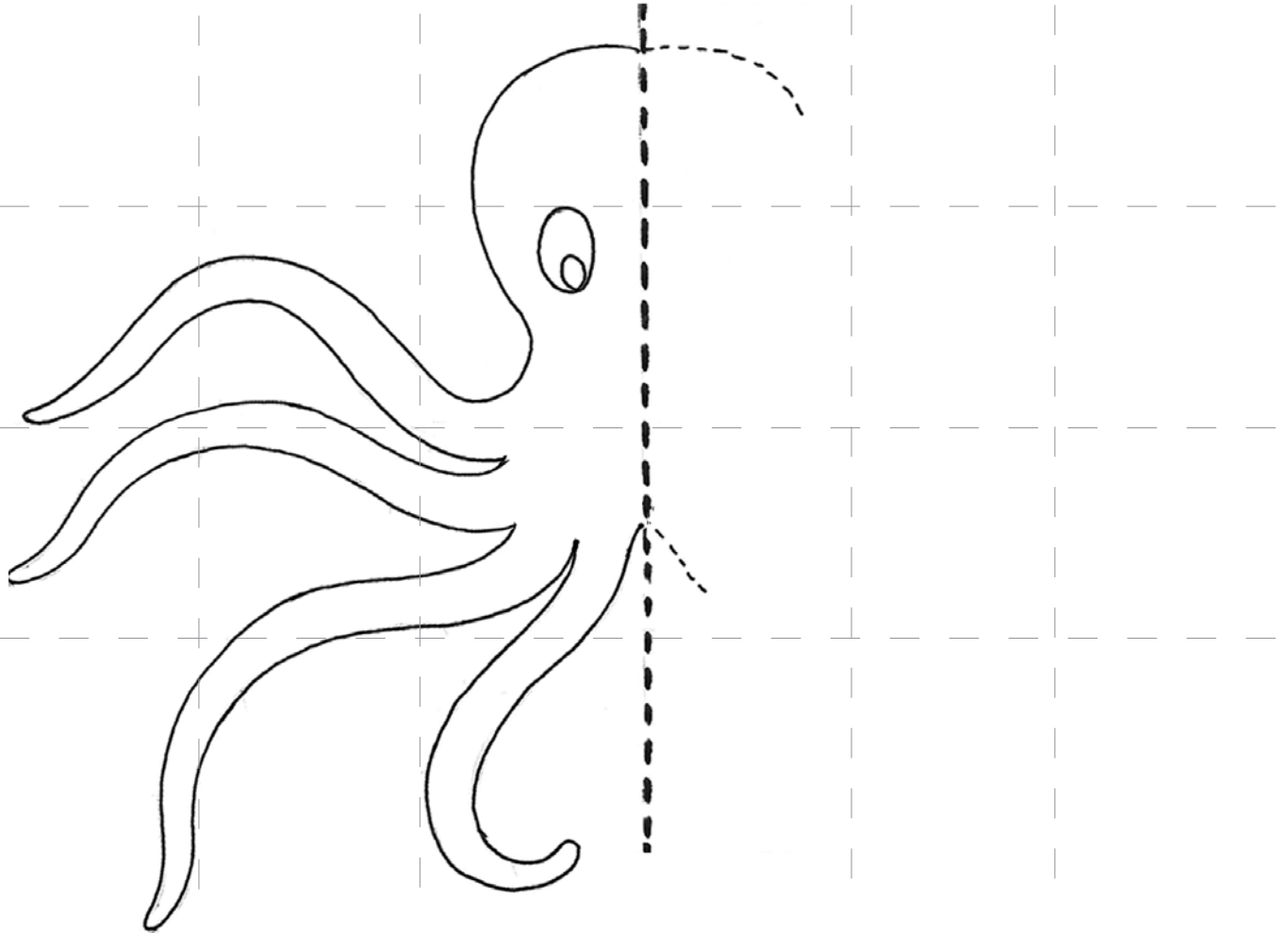
To export sardines, we put 4 of them in one box. If we have 2,000 sardines, how many boxes do we need?

Next, one carton contains 25 boxes. How many cartons will we need to export 2,000 sardines?

MORE DIFFICULT : If 2,000 cartons fill a container, how many sardines must we catch to fill the container?

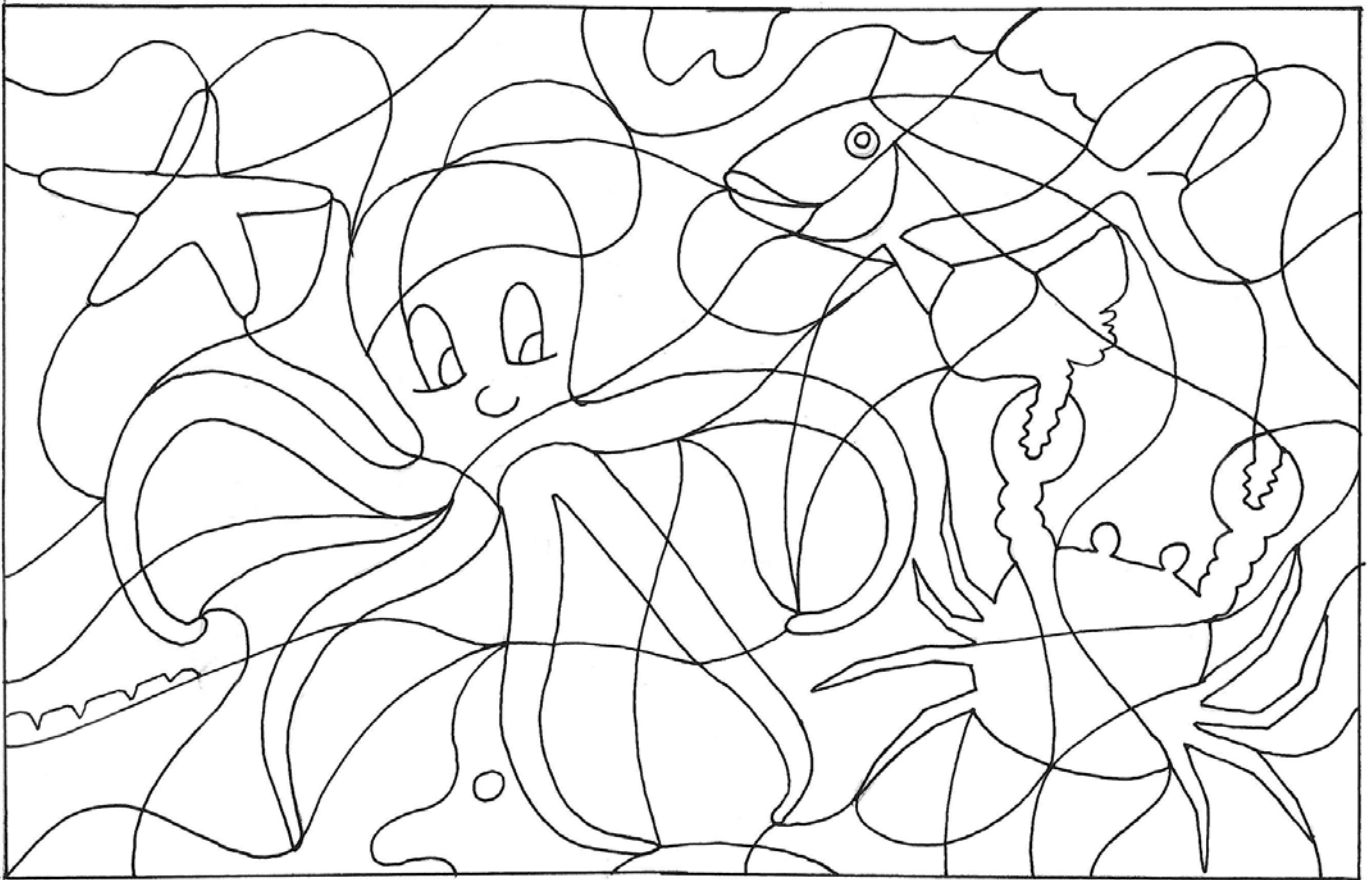
Applicscience

Complete the drawing by symmetry.



coloring

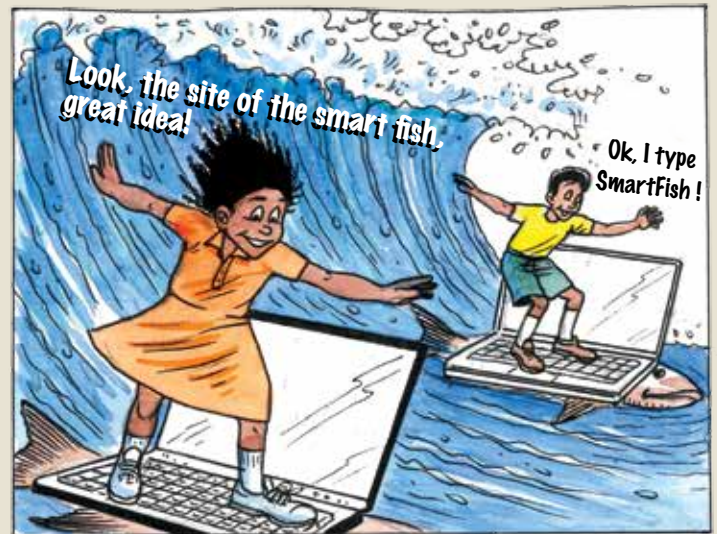
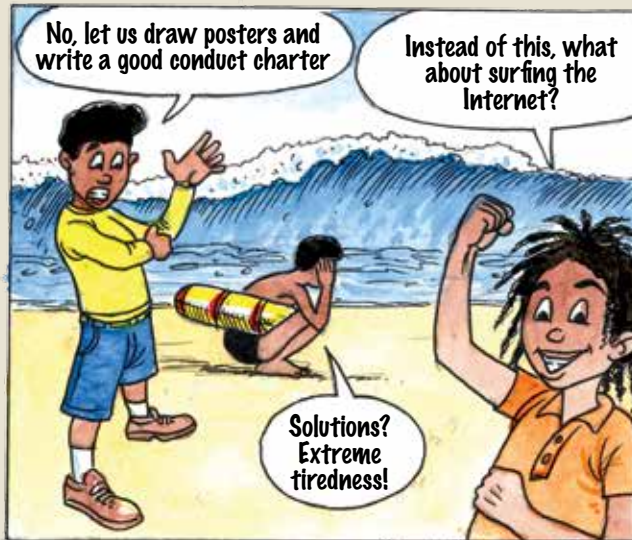
Color the picture in order to find the crab, the octopus, the fish, and the starfish





DANGER : WHAT CAN WE DO TO SAVE THE SEA?

To save the sea, the children decide to work together to find solutions.



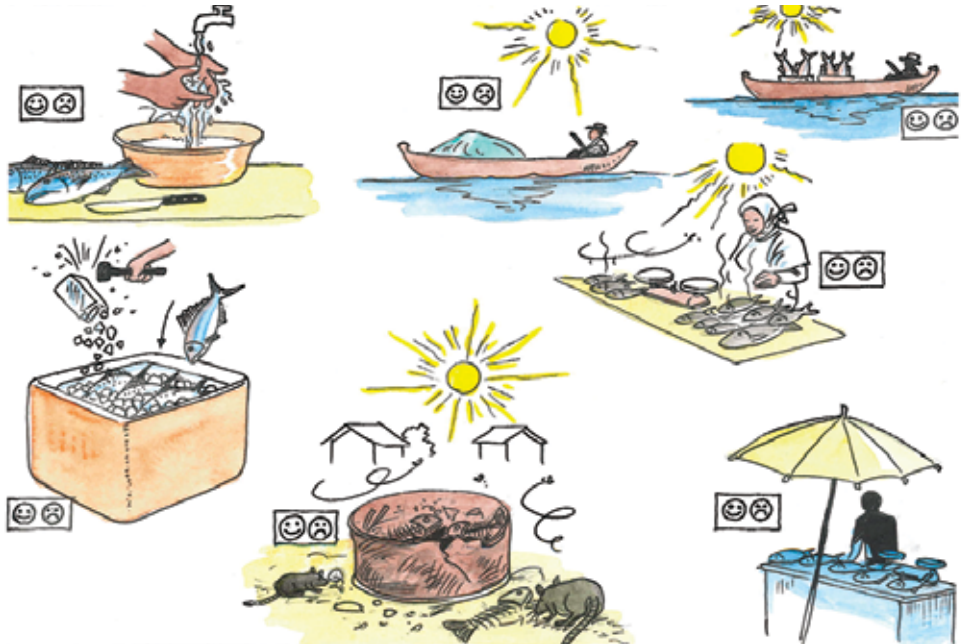
Land and sea are suffering, resources are becoming increasingly scarce, and fishermen are better equipped. We must help each other to protect ecosystems, catch fish reasonably, and reduce wastage.



wastage happens when we forget to turn OFF the tap, we do not turn OFF the lights, we use too much plastic packaging unnecessarily. In your opinion, let fish deteriorate in the sun, cut the fins of the shark and put it back to sea, throw back fish that the fisherman does not want to keep, not use the remains of fish processed at the plant, is this not wastage also?

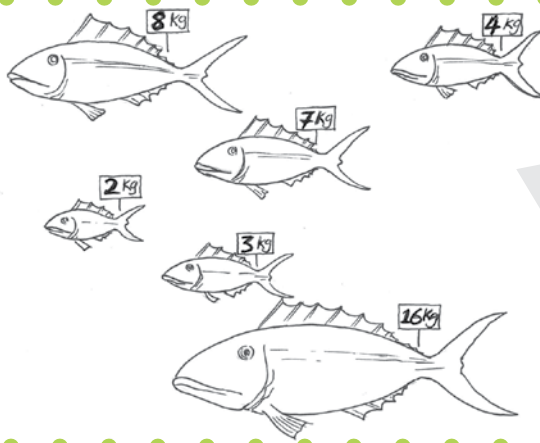
Observation

Look at the pictures. Encircle each drawing's icon, according to its being a good or a bad hygienic practice.



ECO-LOGIC

At the market, we have fish of different weights. Color the fish in red and blue in order to make two piles of 20 kg each.



Magic

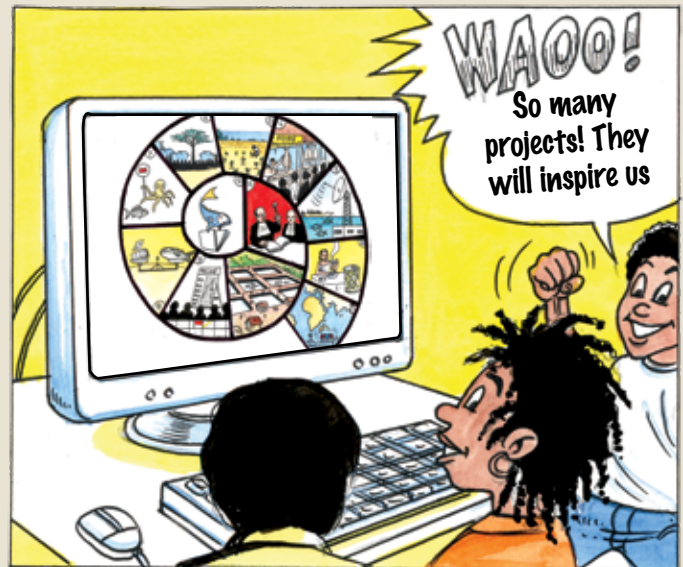
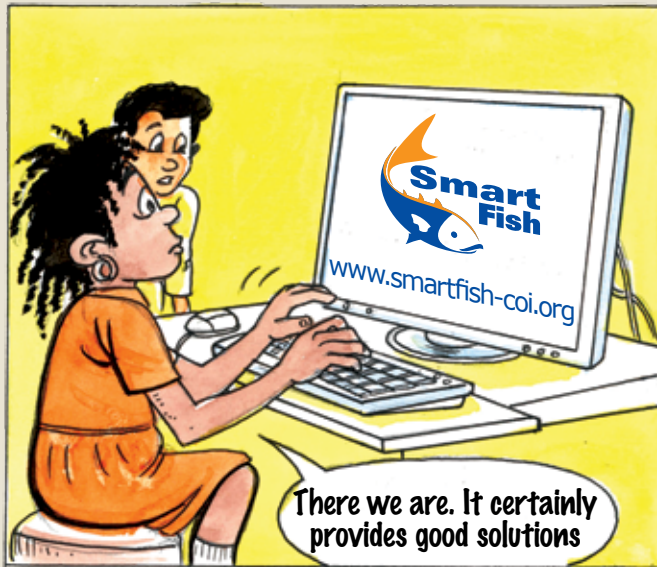
THE MAGIC BLUE

Look closely an object or cloth of a flashy blue, count up to 50, and then close your eyes. What color do you see? Yellow. Present this magic trick to your friends.



THE SMART FISH SITE.

Surfing the Internet, the children discover that there are solutions already. The Food and Agriculture Organization (FAO) of the United Nations carries out several projects with the people of the countries in the area.



In our region, **SmartFish** has implemented **projects**. The smart fish found **adapted solutions** for each country. For example, about **saving ecosystems, restoring damaged lagoons**, changing **destructive fishing methods**, finding new jobs for fishermen, educating about the **importance of fish** in the diet and **ensure food** for everyone.



IOC means Indian Ocean Commission.

FAO means Food and Agriculture Organization of the United Nations.

Do you know any acronyms that exist in your country (for the post office, radio, TV, a department store, gas station, etc.)? Make up one for your school. For example, for a group of lagoon, reef, and mangroves conservation, we can write LRMC.

GMO (acronym meaning Genetically Modified Organism) has become Grand Master O in the comic strip. With the same initials, invent other funny names. Try with IOC and FAO.



SCHOOL

TOXIC

IRRITANT

FLAMMABLE

RECYCLING

NO SMOKING

HERD

WILDFIRE

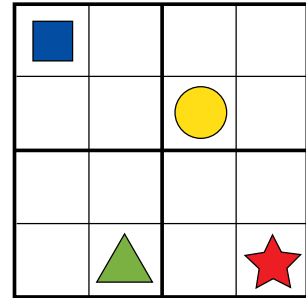


Make up a sign to ban throwing garbage on the beach and another one to save water.

ECO-LOGIC

SUDOKU

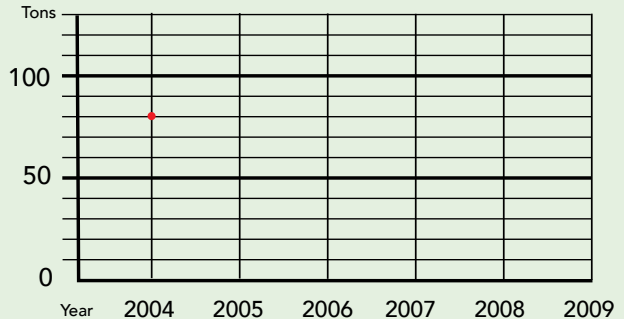
Complete the grid so that each of the four forms appears only once on each row, column and 4 frames square (area). In other words, each of these sets must contain all the forms.



Brain storm:

In each country and for each species caught, scientists record the figures according to the catches. Draw a graph showing the number of fish caught by a boat in the Indian Ocean over the past six years. Place the points and draw a line between them to make the curve of the graph, according to data presented below. Place the years on the horizontal line and the weight on the vertical line of the graph.

2004 : 80 tons
 2005 : 90 tons
 2006 : 100 tons
 2007 : 120 tons
 2008 : 110 tons
 2009 : 90 tons



Observe the curve; is it going upwards or downwards? Does that mean that the boat is fishing more or less over the years? Think about another explanation for the curve changes.



THE REGION IS ON THE MOVE.

On the SmartFish site, children discover the projects and good practices initiated.

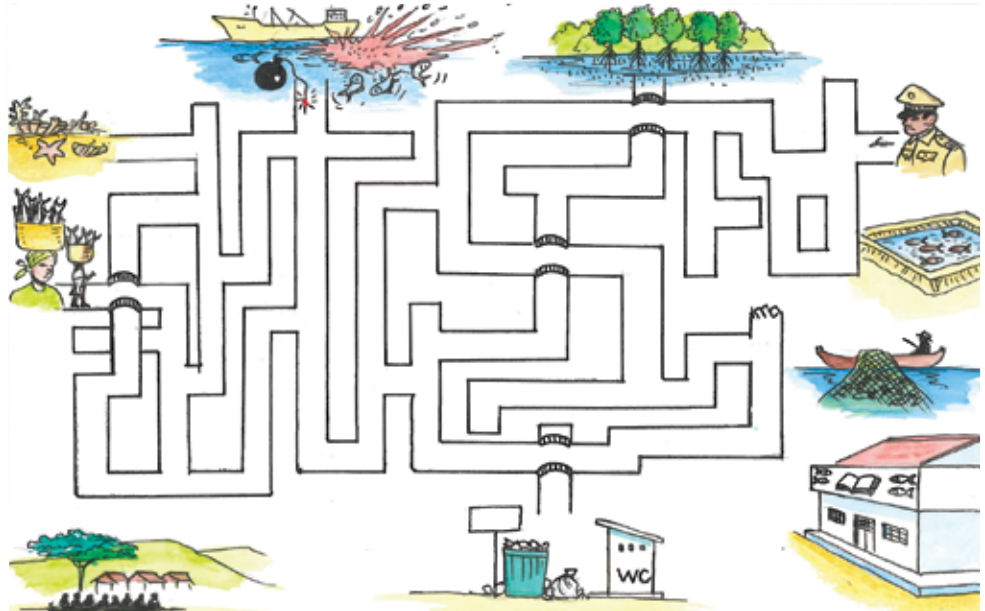


1. Fight against illegal fishing
2. Food security
3. Fisheries monitoring
4. Regional products and fairs quality
5. Reforestation of mangroves and coastal protection
6. Co-management of projects with the population
7. Seasonal closures and protected areas
8. Fight against waste and fair trade
9. Training and education
10. Aquaculture and fish breeding
11. Laws and regulations
12. Educational booklets



Looking at the drawings in the nautilus and the related projects, which ones are most important to your country?

ECO-Logic



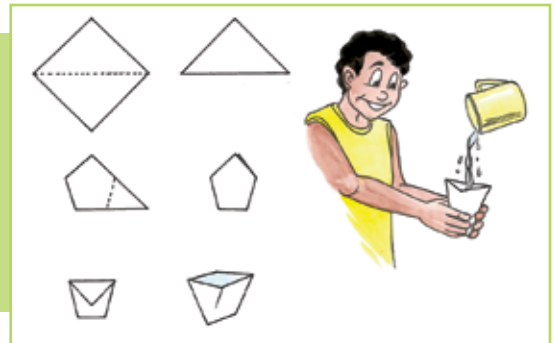
1. To catch the person fishing with dynamite, the police officer must pass the aquaculture pond
2. Then cross the bridge in front of the mangrove forest
3. As he does not find him, he will the seine fisherman if he has seen the fraudster
4. This latter will tell him to pass the fishing school before reaching the bathing area
5. Finally, he will ask the community of villagers
6. They have heard the blaster near the bridge that is in front of the market. Finally, he manages to catch the fraudster

DO IT YOURSELF
MAKE A PAPER
CUP

Equipment: a sheet of paper

Fold the sheet of paper as shown in the drawing.

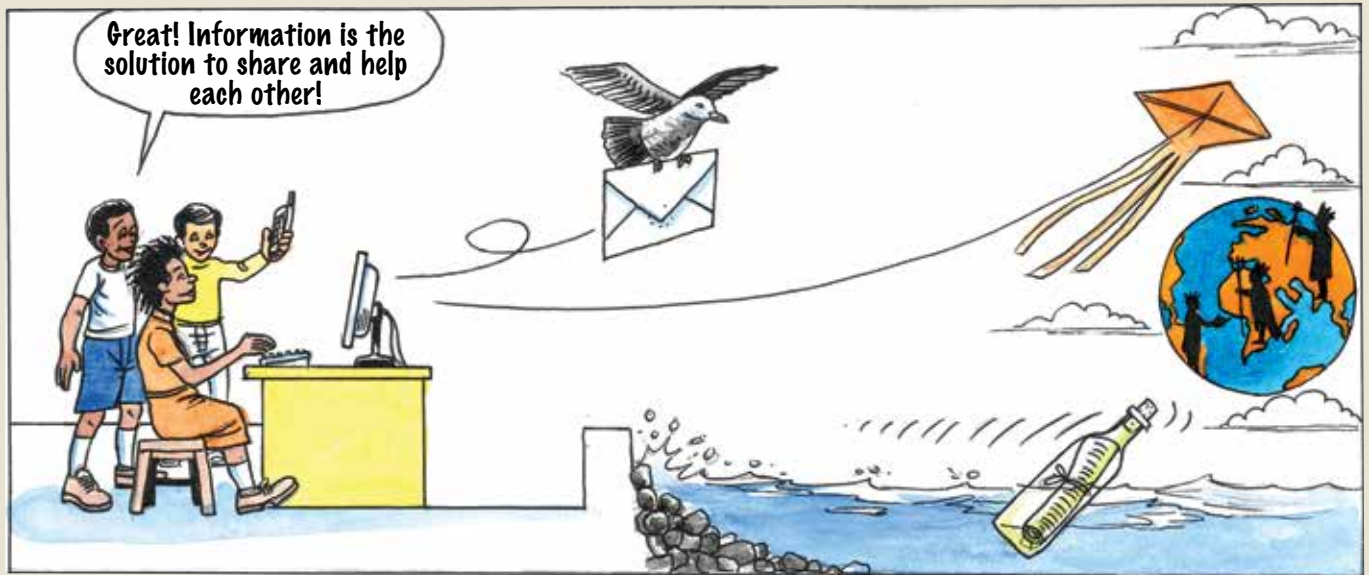
You can now drink from your paper cup!





INFORMATION AND COMMUNICATION.

Children send messages to the World Masters so that they act otherwise.



Formerly, to send a **message**, people threw a bottle at sea or sent a **carrier pigeon**. Messages took weeks to arrive! Now the postman brings the mail, but you can also **communicate** by phone or email.

We send messages faster and faster!

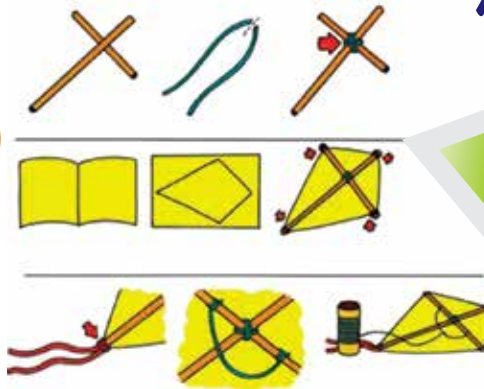


With your classmates, do you talk about the problems of the sea, the destruction of ecosystems, pollution, and about what you found in the booklet? Would you discuss all these issues with adults? Act as if you were making a newspaper, talk about it around you, write down the answers of fishermen with whom you discussed and try to write a text.

DO IT YOURSELF

KITE

Make a kite and attach a Conservation message to it.



Magic Do-it-yourself

Top-secret messages

Equipment: 1 white sheet, 1 lemon, 1 container (bottle cap), a candle, and matches.
Cut the lemon in half. Squeeze it. Pour the contents into the container. Take a small sharp stick and dip in lemon juice. Write something on paper with the stick. Wait several minutes for the juice to penetrate the paper. Ask an adult to take the sheet and gently pass it over a flame (do not put it too close, otherwise the paper may catch fire.) The message appears in a brown color..

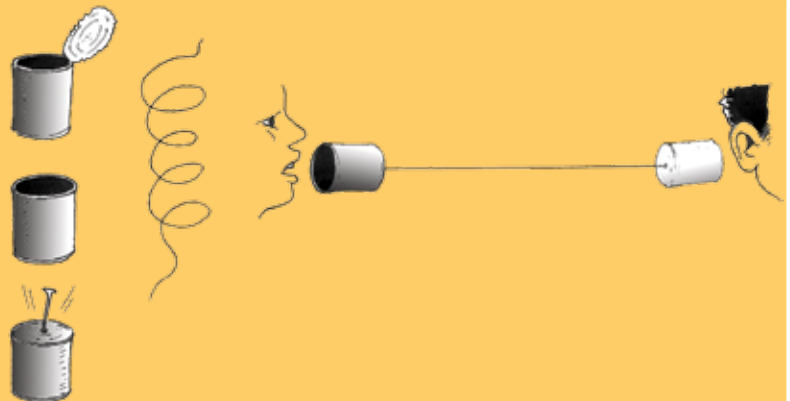
Applicascience

The magic telephone

Equipment: 2 empty cans, a string, and a nail.

1. With the nail, make a hole in the bottom of the 2 cans.
2. Connect the cans with the string and tie a knot inside each box
3. Place a tin in front of your mouth and the other against the ear of a friend.
4. Talk to your friend in this craft phone.

Do not try underwater. Pity, it works better.





HOORAY !

THE (CHILDREN HAVE FOUND WAYS TO REASSURE THE SEA.

They adopt this formula: knowledge, knowhow, manners, and they decided to write a song for the sea.



The sea is **endangered**, species are **threatened**.
Thank you children for **getting involved**, learning to have
better knowledge, knowing better to manage better,
managing better to build a sustainable world.



The struggle goes on so that the sea never gets angry again. Countries of the region should get further involved in actions for the protection of ecosystems, food security, against illegal fishing, bad practices and that each of us becomes a smart fish.

DO IT YOURSELF 'PAPIER-MÂCHÉ' FISH

Equipment: A balloon to inflate, newsprint paper or tissue paper, carpet glue, paint, cardboard.

Inflate the balloon and coat it with glue. Tear strips of paper. Glue them on the balloon to cover the balloon completely.

Make 3 layers. Let dry for one day. Pierce the balloon and remove it from the paper ball. You can add a tail and fins made of cardboard. Paint your fish with colors that you like.

If you do not have this equipment, you can also organize a sculpture contest in the wet sand with your friends, for the most beautiful turtle or the most beautiful fish.

Magic

FOLDED PAPER

Challenge your friends: I bet you cannot fold this sheet of paper more than 7 times on itself! Whatever the size of the sheet you will see that it is true!

Do you know?

100 billions
neurons circulate messages to your brain. So do not hesitate, use your brain!

Game for 2: Who is this?

In your head, you think of someone or something. It could be someone in your class, your family, an animal, or an object. Your friend has to guess what you think: he will ask you questions for which the answer will ONLY be YES or NO. For example: Is it a boy, is he it in my class, does he like singing, etc. Your friend has to guess who it is and then it will be up to him to think of someone.

QUESTION

A shark weighs 150 kg, which is 50 kg more than tuna and 300 times more than a mackerel. How heavy is the tuna? And the mackerel?

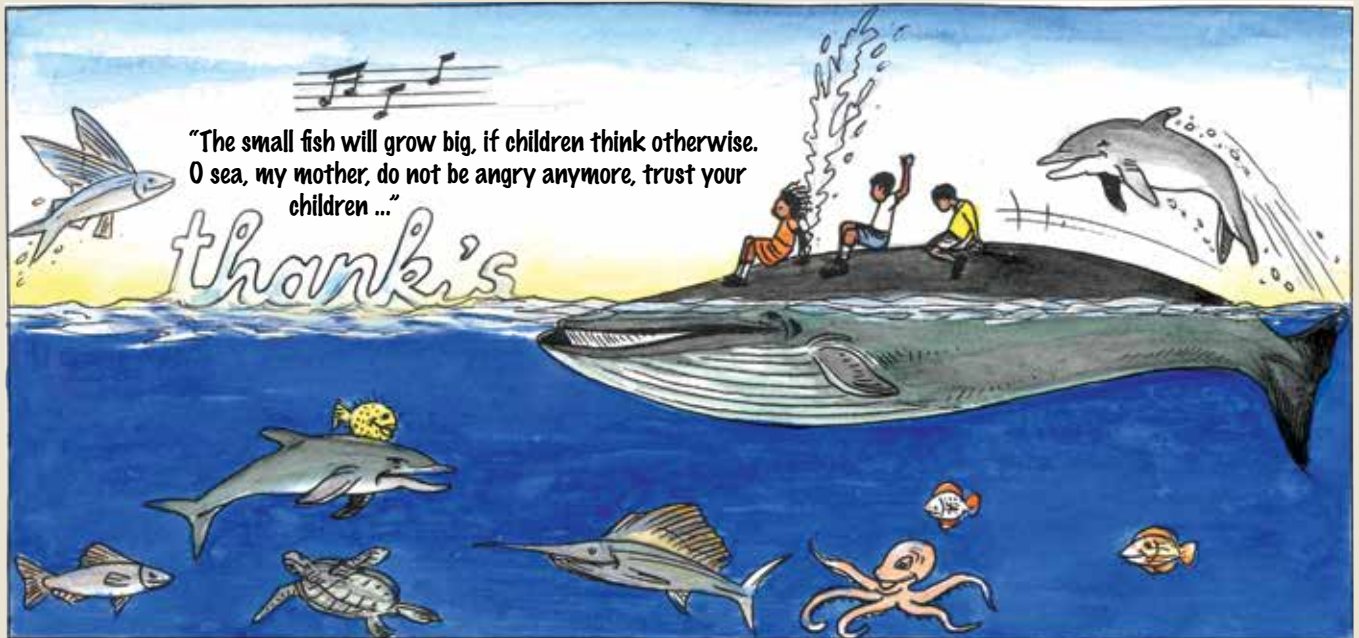
TRICK QUESTION

In your opinion, which is the heaviest, 1 kg of feathers, 1 kg of water, or 1 kg of sand?



THE SLAM OF THE WHALE.

The sea is rejoicing. They will sing their slam with all the inhabitants of the lagoons and the ocean. Let us sing with them!



You, **children**, can **change things**. You can set up a club for **nature conservation**, for **cleaning the beach** with friends; explain to adults that we should **stop polluting** or **wasting water**.



Draw posters for the protection of the environment or against waste, get them posted in your school or in your village.

DO IT YOURSELF
PRODUCE
AN ANIMAL FROM
WASTE RECOVERED
ON THE BEACH



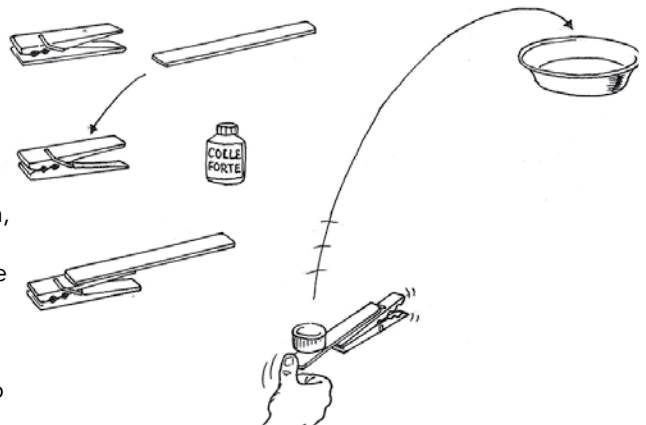
Sound effects
Sound effects
Sound effects

Each player chooses a word to say: toxic, magic, energetic, and repeats the word quicker and quicker in order to make a concert of words. You can bring in musical instruments by tapping with a stick or on a box.

DO IT YOURSELF
THE CATAPULT

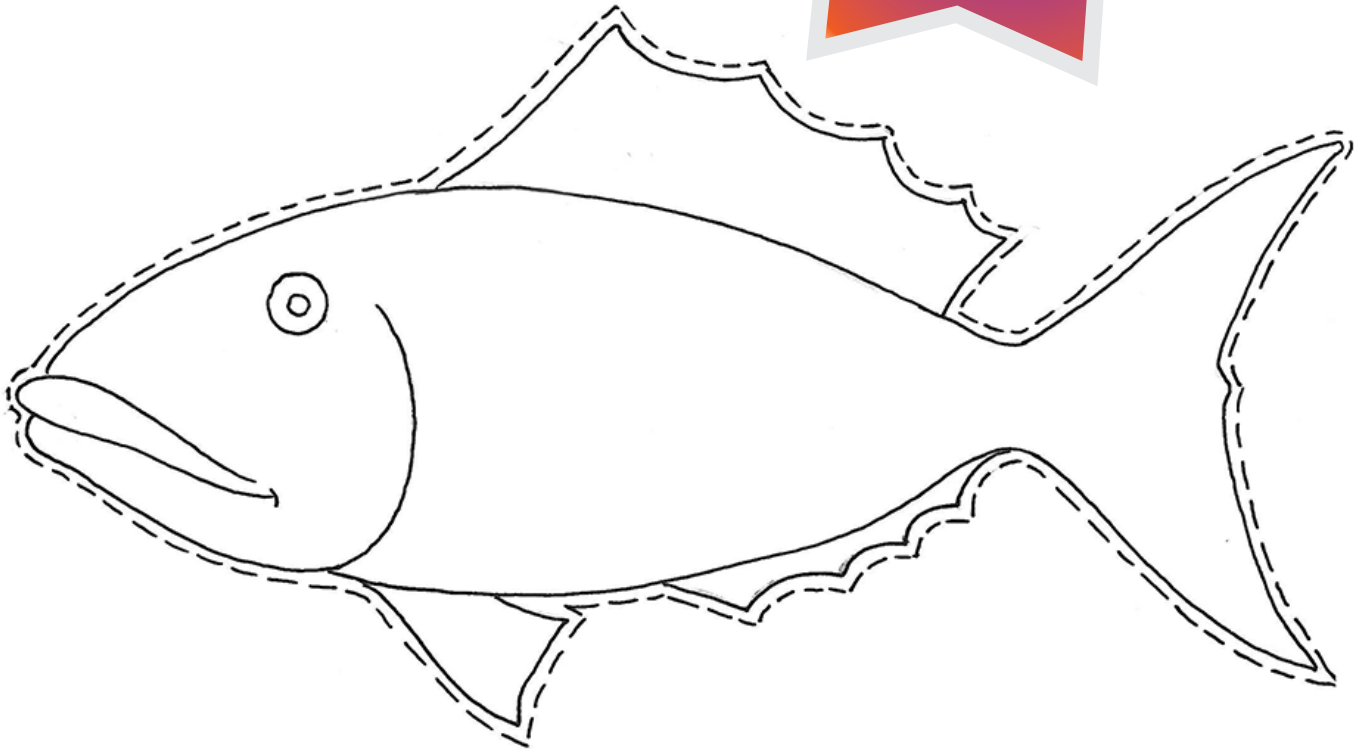
Equipment: 1 clothespin, 1 ice cream stick, a cardboard box, paper pellets.

Glue the stick to the clothespin, then glue the clothespin on a cardboard box and prepare the paper pellets to shoot. Draw circles in the sand at different distances worth 5 points, 10 points, or 15 points. Practice to aim the target and count how many points you make in 5 shots.



Magic Do-it-yourself

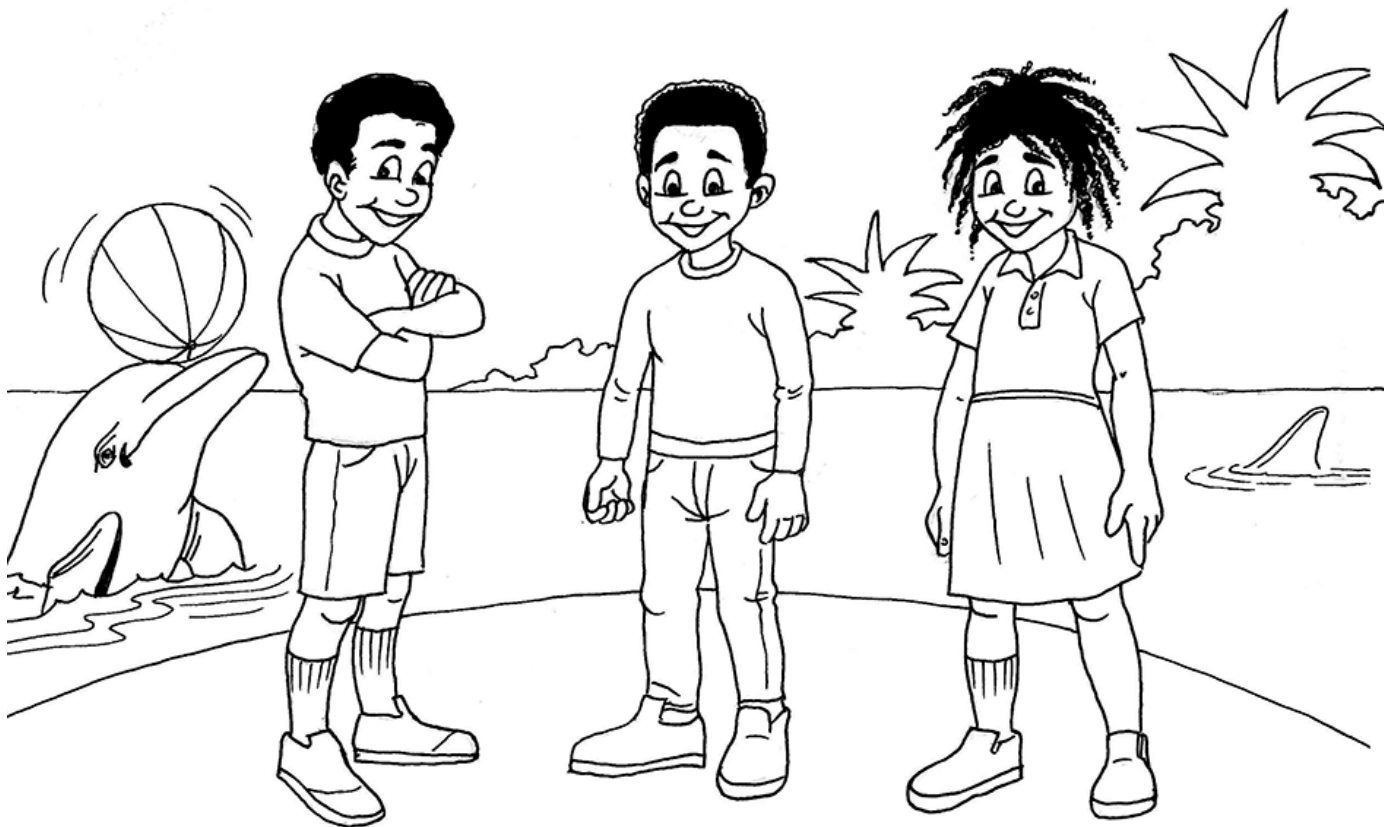
How to
get 2 fish
from t
his one?



On a page of your notebook, draw the same fish as the model with beautiful colors. Then, with a pin, prick along the contour so as to detach it easily. In the place of the one you cut off, you will find a new fish to color on the page underneath.

coloring

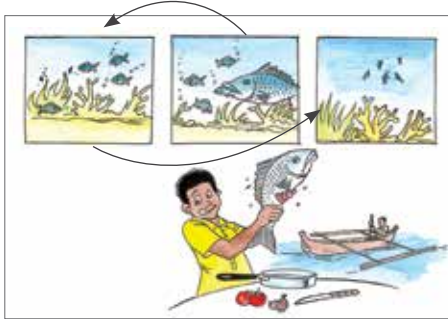
Color the heroes of the comic strip.



Games Solutions

Page 6 Urchin, crab, fish, clam, turtle, shark.
 Are dangerous: sea urchin, shark.
 Have teeth: shark.
 Do you know? – Otherwise, it sinks.

Page 8



Food chain:
 Of course, the small fish do not eat the big fish.

Eco-logic: ○ □ △ □ ○ □ △ □ ○

There are two solutions: 5 – 7 – 10 – 14 – 19 – 25 or 5 – 7 – 10 – 14 – 20 – 28

Explanation: you can do it by $5+2=7$, $7+3=10$, $10+4=14$, $14+5=19$, $19+6=25$, etc.

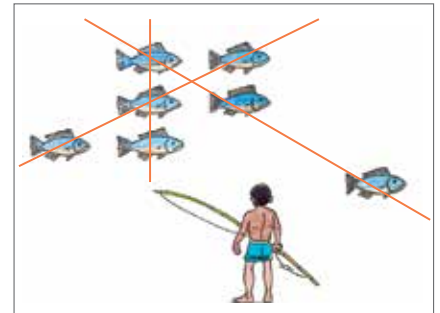
Or, like this, $5+5=10$, $7+7=14$, $10+10=20$, $14+14=28$, etc

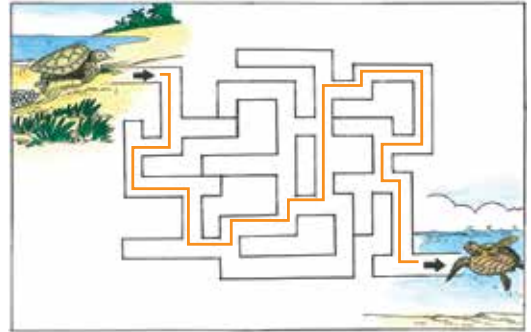
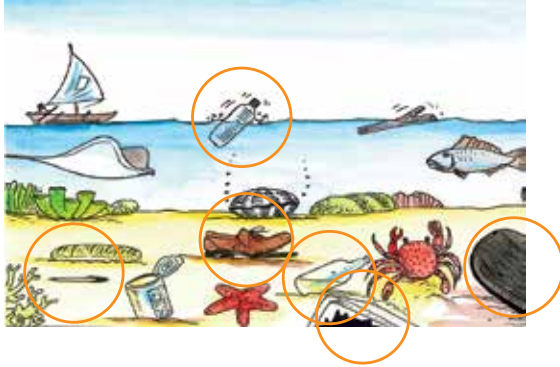
Page 10 Sea cow, cow, sea elephant, elephant, sea turtle, land turtle, bird, sea bird, fields flower, algae, horse, sea horse (hippocampus), shell, snail, spider.

The intruder: elephant seal.



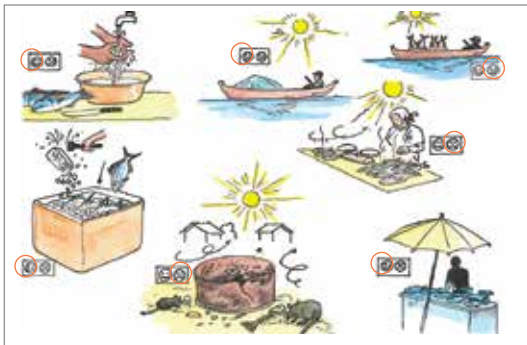
Eco-logic:



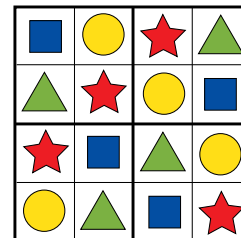


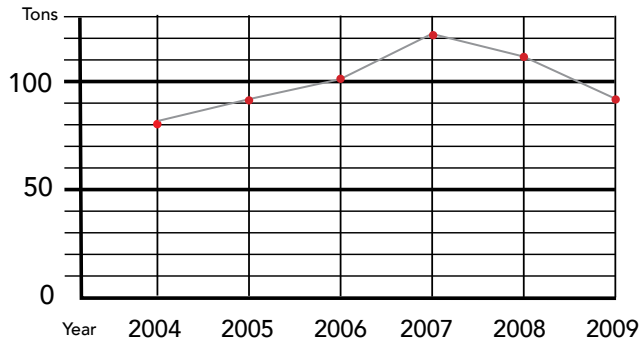
- Page 16
- The shrimps travelled 19,262 Km.
 - We need 500 boxes to pack 2,000 sardines.
 - We need 20 cartons to pack 500 boxes.
 - You can put 100 sardines in a box and therefore 200,000 sardines in a container.

- The whale has 3 rows of teeth
- The shark has fins
- The coral has scales
- The fish is made up of polyps
- The crocodile has vents

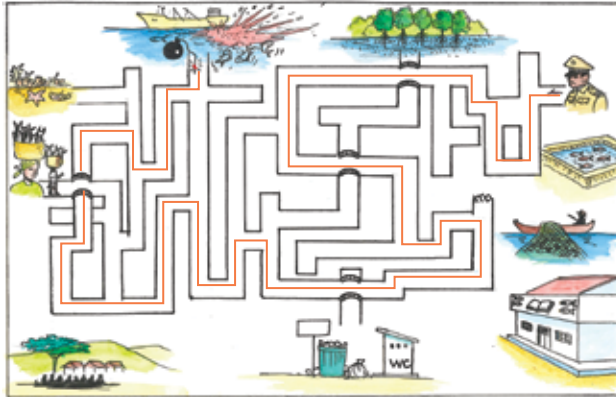


Eco-logic: Fish weighing
 $7 + 3 + 8 + 2 \text{ Kg} = 20 \text{ Kg}$ will be in one pile
 and those of $16 + 4 \text{ Kg} = 20 \text{ Kg}$
 in the other pile





The curve goes upwards, this means that the boat fish more and more over the years. It goes downwards in 2008, perhaps following a prevention campaign against overfishing.



Page 28 Question : The tuna weighs 100 Kg and the mackerel 0.5 = 500 g.
 Trick question : It is the same thing; all of them weigh 1 Kg.



- SmartFish beneficiaries countries
- Participating countries although not as beneficiaries countries

The present activity book has been conceived by the SmartFish Programme in the framework of the sensitization activities for the young generation.

In collaboration with the ISLANDS project, and through the fisheries management (result 1) of the SmartFish Programme, FAO organized a puppet tour on the marine environment preservation.

The puppet show performed 26 times in Comoros, Kenya, Madagascar, Mauritius, Reunion Island, Seychelles, Tanzania and Zanzibar during the months of February and March 2014.

After the performances, the children were given this activity book, in order for them to continue having fun and learn how to protect the marine environment and its resources.

SmartFish is a regional fisheries programme managed by the Indian Ocean Commission, funded by the European Union and co-implemented by the Food and Agriculture Organization of the United Nations. SmartFish, which operates in twenty countries throughout the Indian Ocean Region, Southern and Eastern Africa, focuses on fisheries governance, management, monitoring control and surveillance, trade, and food security.

ISLANDS is a project of the Indian ocean Commission, funded by the European Union. To contribute to an increased level of social, economic and environmental development as well as deeper regional integration in the Eastern and Southern Africa - Indian Ocean (ESA-IO) region through the sustainable development of SIDS.

