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iGUi®

ecologia



Brazil
4^o EDI
TION





Scientific Program



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✉ ecologia@igui.com
 📱 @iguiecolgia
 📷 @iguiecolgia
 🌐 iguiecolgia.com

IGUi Ecology annually awards five undergraduate students with a monthly scientific initiation grant for a 12-month period, during which each student develops a study related to water (fresh, brackish or marine) covering at least one of the following topics: aquatic and marine biology, environmental contamination, economic sustainability, diseases involving aquatic organisms, oceanography, limnology, fluviology, hydrogeology, environmental engineering and similar fields.

At the end of the program, the study will be presented at scientific events in the form of a panel discussion or oral presentation, in which the student shows the results.

FIVE STUDIES WERE DEVELOPED IN 2019 AND WE ARE NOW GOING TO SHOW THEM TO YOU!

Study 1

Variation in the diet of male and female La Plata dolphins, *Pontoporia blainvillei* (Gervais & D'orbigny, 1844) (Cetartiodactyla, Pontoporiidae), on the northern coast of the State of Santa Catarina.



This study provides information on the diet of the La Plata dolphin, *Pontoporia blainvillei*, which is one of the smallest species of dolphins and the most endangered in the Western South Atlantic due to anthropogenic impacts, especially incidental catches in fishing nets. The aim of this study was to evaluate the occurrence of variations in the diet of male and female La Plata dolphins. We analyzed the stomach contents of 40 individuals found beached between October 2015 and October 2018. The study area was the northern coast of the state of Santa Catarina as well as the internal portion of the estuarine complex of Babitonga Bay. This study was presented orally during Biologist Week in São Francisco do Sul, Santa Catarina on September 2nd, 2019.

Student: Daniele Laibida Rodrigues Lopes
Advisor: Prof. Dr. Marta Cremer

Study 2

Postcranial Anatomic Description Of The Broad-Snouted Caiman, *Caiman latirostris* (Daudin, 1802) (Crocodylia: Caimaninae), From The 2c Conservationist Nursery In Cachoeiro Do Itapemirim, State Of Espírito Santo.

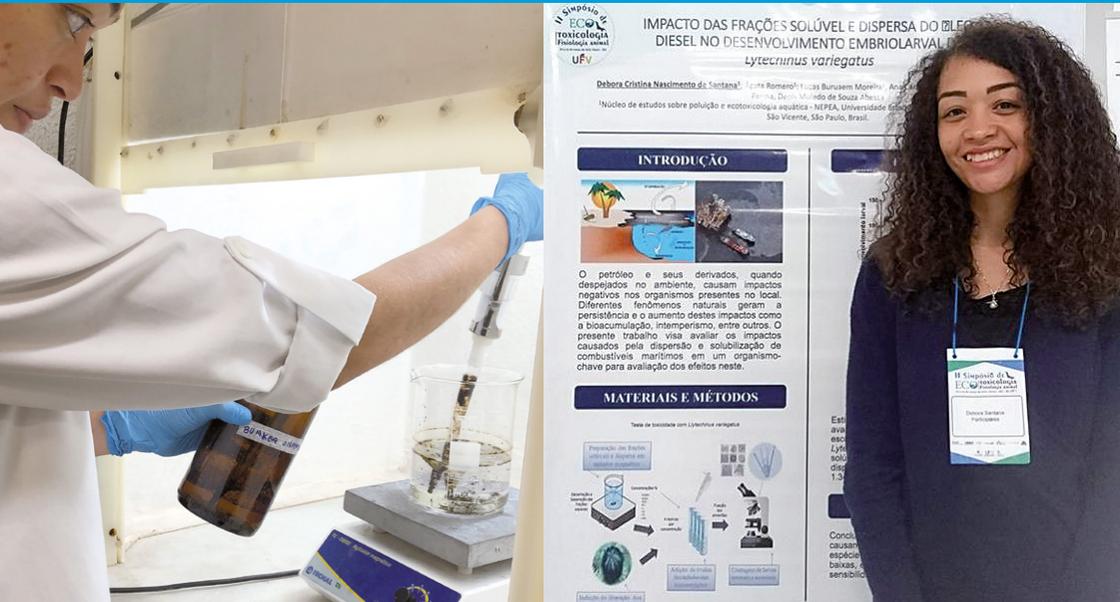


The species *Caiman latirostris* is commonly known as the broad-snouted caiman and has broad geographic distribution in South America, where it is found in Brazil, Argentina, Bolivia, Uruguay and Paraguay. Its largest of area of coverage is in Brazil, especially in the Atlantic Forest, where the population has been critically reduced and is seriously threatened by human actions. Few fragments of the original forest remain, which places the species at risk. These data are fundamental to greater knowledge on the evolutionary history of the broad-snouted caiman and use in analyses on the occurrence of fluctuating asymmetries, diseases and morphological variations that may be caused by environmental stress. Thus, the aim of the present study was to perform an anatomic description of the postcranial bones. This study was presented in the form of an oral presentation and poster at the 4th Capixaba Symposium on Biological Sciences with the title "Anatomic Description of the Cervical Vertebrae of *Caiman latirostris*."

Student: Phillipe Melquiades d'Angelo Corrêa
Advisor: Prof. Dr. Rodrigo Figueiredo

Study 3

Bioassays of Chronic Toxicity in Marine Microorganisms (*Nitocra Sp. And Perna Perna*) and the Effect of the Soluble and Disperse Fractions of Watercraft Fuel Oil in the Water Column.



Petroleum-derived compounds are formed mainly by hydrocarbons and enter the aquatic environment through anthropogenic actions, such as accidents or continual use, which leads to the accumulation of these compounds in rivers, estuaries and marine environments. Once in the environment, oil undergoes different degradation processes, which increase its toxicity. In the present study, we conducted toxicity assays using the soluble and dispersed fractions of two types of watercraft fuel (diesel and Bunker c). We determined the dilution percentage threshold that can cause toxicity to aquatic biota. The results show that these oils can have harmful effects on reproduction, indicating a hazard to natural populations. This work was presented at the 2nd Symposium on Ecotoxicology and Animal Ecophysiology of UFV, the 31st Scientific Initiation Conference and the 1st Symposium on the Biodiversity of Coastal Environments in September 2019 in the form of panel discussions.

Student: Debora Santana
Advisor: Prof. Dr. Denis Abessa

Study 4

Removal of Nutrients Related to Mariculture Activities from a Brackish Lagoon Using Algal Turf Scrubber Systems.



The increase in human populations in coastal areas and the inadequate treatment of sewage can lead to an environmental problem denominated eutrophication, the main cause of which is an excess of nutrients discharged into waterbodies. Bioremediation is the use of organisms to reduce or remove contaminants from the environment and is a promising solution for the treatment of effluents rich in organic matter. This is a low-impact method, with low oil consumption and low consumption of chemical inputs categorized as an ecological engineering technology. We evaluated the use of Algal Turf Scrubber systems as a potentially lucrative technology for the removal of nutrients from surface waters, municipal effluents, aquaria and liquid waste from dairy products and pig farming. To test the efficiency of this method on a pilot scale, the system was installed in the facilities of the Mollusk and Bivalve Laboratory located in Barra da Lagoa, Florianópolis. This study was divulged at the 20th Academic Biology Week in the form of a panel discussion and received the award among the best placed in the category. It was the only study to raise bioremediation as the central topic.

Student: Luana de Azevedo Aimi
Advisor: Prof. Dr. Leonardo Rörig

Study 5

Perceptions of Decision Makers in Santos and Guarujá Regarding Coastal Biodiversity and Adaptation to Climate Change

Objetivo: Conhecer a percepção ambiental dos tomadores de decisões das SEMAMs de Santos e Guarujá e membros do Conselho Gestor da APAMILC sobre a biodiversidade de ambientes costeiros e adaptação às Mudanças Climáticas.

Metodologia: Projeto CEP/UNIFESP n.º 0752/2018. Participantes: 6 representantes SEMAM Santos escolhidos por critérios de conveniência e acessibilidade. Entrevista: "O que o Sr(a) considera sobre as questões ambientais e de biodiversidade na região?". Questionário de percepção ambiental.

Resultados: Entrevistas: Questões ambientais e biodiversidade relevantes para a região. Respostas obtidas: coleta seletiva e educação ambiental; saneamento ambiental; consumo consciente; incentivo à alimentação orgânica e agroecológica; política de abastecimento e qualidade de vida; falta de pesquisas práticas na região da Baixada Santista. Questionário de percepção ambiental: 50% indicaram estar muito bem informado sobre a perda da biodiversidade, 33,3% bem informado e 16,6% um pouco informado.

Medidas para proteger a biodiversidade: Informar melhor aos cidadãos sobre a importância da biodiversidade (100%), Promover pesquisas sobre impactos na perda da biodiversidade (100%), Alocar mais recursos financeiros para a proteção da natureza no Brasil (17%), Garantir auxílios financeiros para setores como a agricultura ou pecuária que levem em conta a biodiversidade em sua execução (17%), Criar recompensas financeiras pela conservação da natureza (17%), Aumentar as áreas de proteção ambiental no Brasil (17%).

Relação entre biodiversidade e Mudanças Climáticas: A maioria dos entrevistados se mostrou positiva na percepção dos entrevistados, pois todos concordaram que a Mudança Climática é uma ameaça e que a biodiversidade é essencial para enfrentá-la. Esforço para proteger a biodiversidade é totalmente satisfatório. A maioria dos entrevistados não se interessou em se dedicar mais e diminuir os impactos no futuro. Medidas para proteger a biodiversidade: Tiveram maior destaque que envolvem a comunicação com o cidadão e a preservação do incentivo à troca de conhecimentos entre os cidadãos.



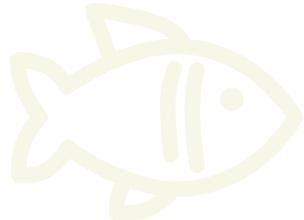
iGUi Ecology participates in numerous events for the conservation and preservation of the environment with lectures and exhibitions of biological materials for environmental education.

Events

The research project consisted of an interactive approach with decision makers. Semi-structured interviews were held with members of the Administrative Board and the directing body of the Central Coast Marine Environmental Protection Area as well as the decision makers of the Secretary of the Environment of Santos and Guarujá, which are located in the state of São Paulo, to gain an understanding of their perceptions regarding the biodiversity of coastal environments and adaptations to climate change. Two-thirds (66.6%) of the interviewees believed that the reduction or extinction of species will have impacts on their lives and that they would feel affected by this loss, declaring that they would like to make more of an effort to protect biodiversity. All believed that this loss should be avoided because our wellbeing and quality of life depend on nature and biodiversity, stating that biodiversity is essential to adapting to climate change and that Brazil will become impoverished with the loss of biodiversity. The measures considered relevant to protecting biodiversity were related to informing the public better regarding the importance of biodiversity and promoting impact studies on the loss of biodiversity. This study was presented and divulged at the 5th Academic Conference: "Unifesp 25 years: Public University, public knowledge" in the form of a panel discussion between June 3rd and 6th, 2019.

Student: Barbara Alice Ranzani
Advisor: Prof. Dr. Ronaldo Adriano Christofoletti

At these events, it is possible to show people of all ages that we need to preserve our natural environment, which has been so affected by human actions. People are shown plastics found in the stomachs of marine animals, anatomic parts of aquatic animals and much more.



BELOW WE HIGHLIGHT SOME OF THE EVENTS THAT INVOLVED THE PARTICIPATION OF IGUI ECOLOGY.

- 🐟 Talk during Environment Week in Niterói, RJ;
- 🐟 Talk on Grael Project during Environment Week in Niterói, RJ;
- 🐟 A Hug for Japonês Island in Cabo Frio, RJ, in homage to the World Environment Day;
- 🐟 Sea Without Garbage Event on Però Beach, Cabo Frio, RJ;
- 🐟 1st Symposium on Biology and Marine Conservation of the Fluminense Federal University (UFF);
- 🐟 Beach cleanup in Arraial do Cabo, RJ.
- 🐟 Talk on the Correct Wave Project of the Secretary of Protection and Civil Defense of Maricá.
- 🐟 Communal work for the oceans- Cleanup Day in Cabo Frio, RJ;
- 🐟 Third Science Fair at Professor Patrícia Azevedo de Almeida Municipal School in Cabo Frio, RJ;
- 🐟 Talk at Vilatur Municipal School in Saquarema, RJ;
- 🐟 Cleanup of the Oceans at Anjos Beach in Arraial do Cabo, RJ;
- 🐟 Blue Flag Event on Però Beach in Cabo Frio, RJ;
- 🐟 Preservation of mangrove in neighborhood of Praia Seca in Araruama, RJ;
- 🐟 Environmental Tourist Service Center in Recife, PE.



**STAY
UPDATED!**

**CHECK OUT UPCOMING EVENTS
THROUGH OUR SOCIAL NETWORKS...**



Conscious Consumption



The issue of conscious consumption has been growing year by year, reaching a greater number of people who decide not to buy something that is unnecessary and those who seek products from ecologically correct brands. Many brands are concerned with the origin of the materials they use, the amount of water and electrical energy employed in the process and the labor force that makes their clothes!

According to the founder of Eco Age (company that certifies brands based on their degree of sustainability), we should ask ourselves 'Am I going to use this piece at least 30 times?' If the answer is 'yes', buy it. Otherwise, it is better to talk a walk and rethink the purchase. Taking good care of clothes, looking for a seamstress to make repairs and buying clothes from thrift shops are good tips for us to follow!

Thinking before consuming and considering how to consume are the best ways to contribute to a reduction in mass production and the waste of water, electricity and raw materials. Use your creativity when putting together your "looks" and be more sustainable every day! Let's rethink our habits and practice conscious consumption!

LET'S RETHINK OUR HABITS AND PRACTICE CONSCIOUS CONSUMPTION!

Who here stops to reconsider whether or not to purchase a product that is for sale? And when this product is linked to fashion? Clothes, shoes and accessories are widely sought items and the consumption of these products is increasing throughout the world. This consumption also generates expenditures of water, electricity and raw materials. If you have never stopped to think about this, now is the time!

Fashion is the second most polluting industry in the world. Moreover, the textile industry consumes around 93 trillion liters of water in production processes. The production of a single t-shirt requires about three thousand liters of water as well as 2 kg of fossil fuels. The most shocking is that this calculation does not consider the water used for cotton production or the processes of washing, ironing and discarding the t-shirt.

AN AVERAGE OF 11 THOUSAND LITERS ARE NEEDED TO MAKE A PAIR OF JEANS AND 8 THOUSAND ARE NEEDED TO MAKE A PAIR OF SHOES.

Other questions that we could pose to ourselves for conscious consumption are:



- 👍 WHY BUY?
- 👍 WHAT TO BUY?
- 👍 HOW TO BUY?
- 👍 FROM WHOM TO BUY?
- 👍 HOW TO WEAR?
- 👍 HOW TO DISCARD?

If any of these questions is not answered, it is better not to make the purchase...

Clothes:
How big is the waste?



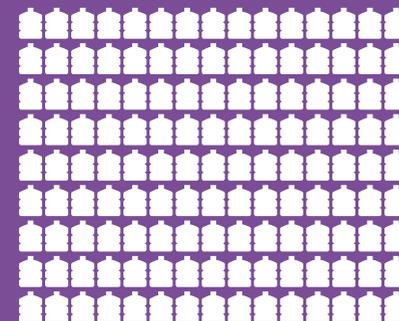
🕒 **1 GARBAGE TRUCK OF USED CLOTHES is burned or sent to landfills every SECOND**

📍 **Enough to fill 1.5 EMPIRE STATE BUILDINGS per DAY**

🕒 **Enough to fill SYDNEY BAY every YEAR**



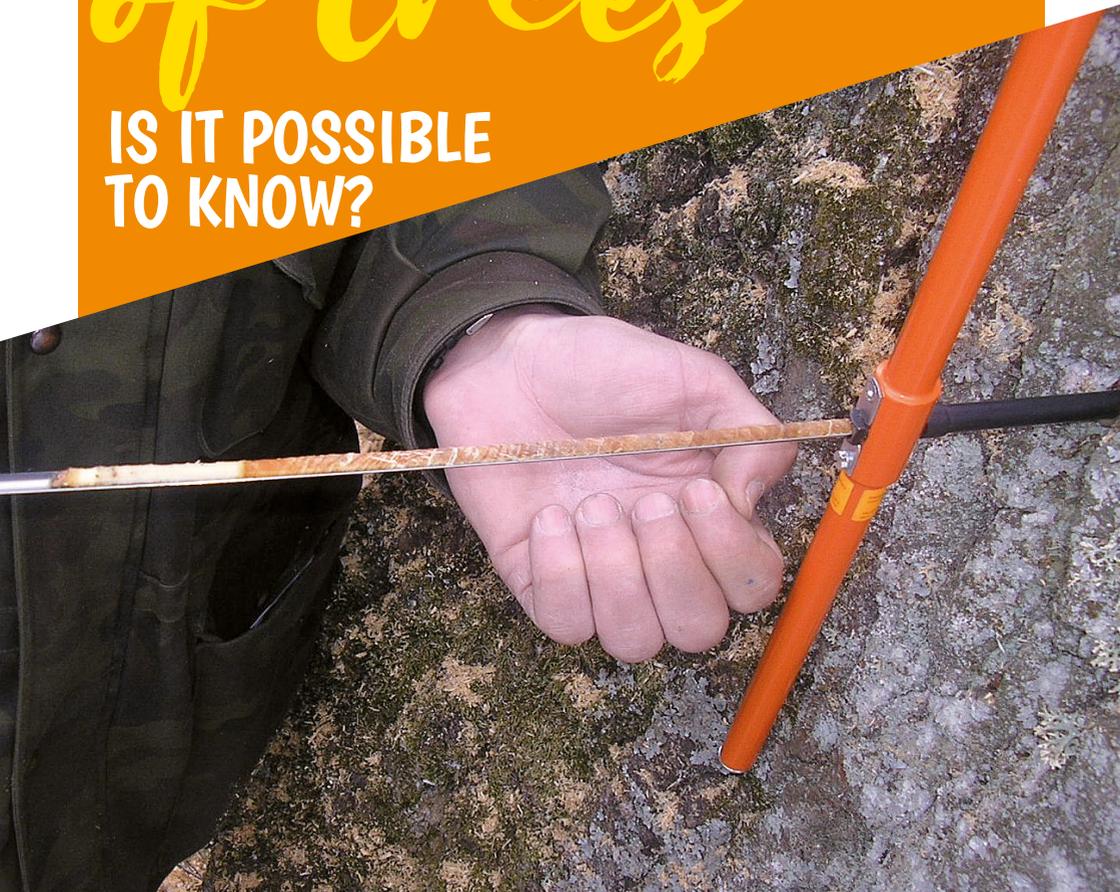
Making 1 T-shirt consumes 2700 liters of water



135 gallons of 20 liters of water

THE AGE of trees

IS IT POSSIBLE
TO KNOW?



Yes, it is possible to know the age of trees. To do so, we need to count the rings that appear horizontally within the trunk.

**BUT HOW IS THIS POSSIBLE?
HOW DO THESE RINGS FORM?**

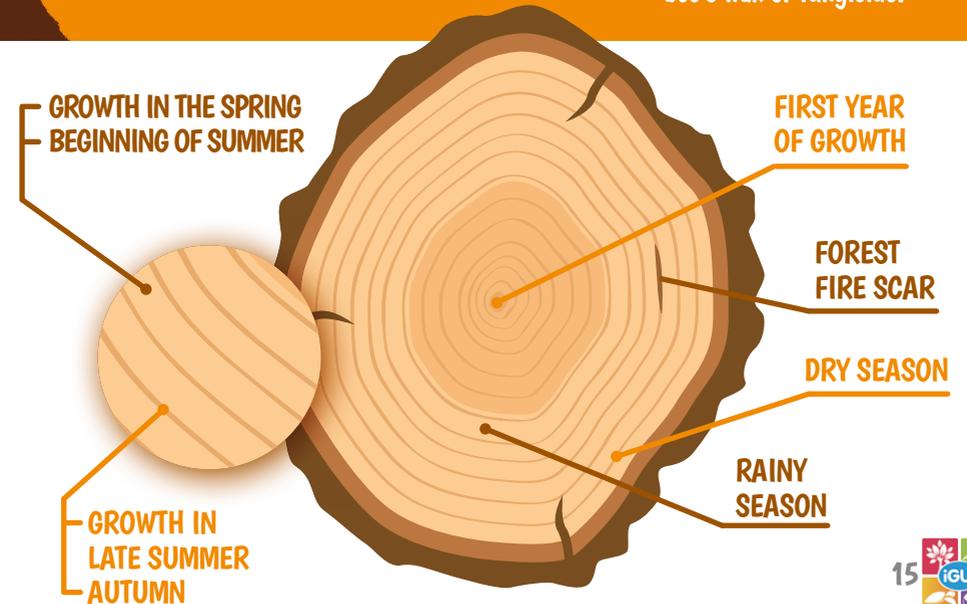
A tree is a plant and has its own metabolism, the velocity of which depends on the species of tree, season of the year (that is, the climate – temperature and rainfall) and the availability of oxygen. These are the variables that form the rings in a tree trunk. A longer period of rain results in a thicker ring, whereas a longer period of drought results in a thinner ring. Another interesting detail is that the growth year is not 12 months, but rather the period in which the tree grew that year.

But how can we determine the age without cutting down the tree?

According to Márcio Coraiola, professor of Forest Engineering at the Pontifical Catholic University of Paraná, it is indeed possible with the aid of an instrument known as the Pressler borer.

THE STEP-BY-STEP METHOD IS DESCRIBED BELOW:

1.  With the aid of a Pressler borer, remove a core from the bark to the center of the trunk (pith) at a height of 1.30m from the ground.
2.  The borer works like a corkscrew and removes a cut from the interior of the tree. Using this core, a specialist counts the growth rings, which indicate the age of the tree, without cutting it down.
3.  Trunks are not perfectly circular and may have a decentralized pith, which is more difficult to find. This requires the removal of several cores.
4. The hole is closed with bee's wax or fungicide.





Ecological Footprint

Measures the human action impacts on nature, analyzing the bioproductive amount area needed to supply people's demand for natural resources and for the carbon absorption (CO₂).

The ecological footprint concept was first published in 1996 in the book entitled, "Our Ecological Impact - Reducing human impact on the Earth" and consists of a method for evaluating how much natural resources we use to sustain our lifestyle. The ecological impact corresponds to the size (in hectares) of productive areas needed to generate the products, goods and services that sustain the lifestyles of each person, counting renewable biological resources (grains, vegetables, meat, fish, wood, fibers, renewable energy, etc.) segmented in agriculture, pastures, forests, fishing, constructed area, energy and carbon dioxide (CO₂) absorption.

There are numerous "calculators" available on the internet that enable calculating the ecological footprint. However, all are based on global lifestyles, which often do not adequately reflect Brazilian society. During the fifth edition of the Education Conference, WWF-Brazil launched the Brazilian ecological footprint calculator. The difference of this calculator is that it was adapted to life in Brazil and is much more precise than the previously used method.

You can check out your ecological footprint on the site: www.pegadaecologica.org.br to gain a better understanding of how your lifestyle impacts the environment and receive tips on how to diminish this impact.



Water Footprint



When we think about the volume of water consumed by each person, we generally only think about the water used for taking a shower, drinking, cooking and washing. However, there is a considerable volume that we consume indirectly, such as the water used in the production of foods, manufacturing, the transportation of products, etc. We have the water footprint to know the amount of water employed in the production of the goods and services we use. Like the ecological and carbon footprints, the water footprint helps us understand the impact caused by our lifestyle on the environment and how to reduce this impact.

The water footprint concept was presented in 2002 by Arjen Hoekstra at the International Expert Meeting on Virtual Water Trade and can be classified into three main types: green, blue and grey. The green water footprint is the water from the rain that evaporates or is added to a product during the production process. The blue water footprint regards surface and ground waters that evaporate or are aggregated to products. The grey water footprint regards the volume of water necessary to dilute the pollution generated by the productive process.

The importance of this indicator is proportional to the importance of water to living beings. Even in Brazil, which is a country with an immense reserve of freshwater, there are places that suffer from a lack of water and the more we understand how water is used, the better we will be able to preserve this resource. You can calculate your water footprint at the site

www.watercalculator.org

Below is a list of some products and how much water is spent for their production:

- 1,782 : 1 kg of sugar | sugarcane
- 2,497 : 1 kg of rice
- 287 : 1 kg of potatoes
- 560 : 1 kg of oranges
- 255 : 250 ml of milk
- 4,325 : 1 kg of chicken meat
- 15,415 : 1 kg of beef



Carbon Footprint

The carbon footprint is the carbon emitted into the atmosphere by a person, activity, event, company, organization or government. For us to have an idea of the quantities emitted, all these gases can be converted into measures of carbon equivalent, carbon dioxide equivalent (CO₂ eq). When we measure the amount of carbon equivalent emitted into the atmosphere, we have the carbon footprint.

Here are some examples of activities that generate carbon emissions: fires, deforestation, the creation of pastures for cattle, etc. When released in excess, this gas accumulates in the atmosphere and causes profound climatic changes. The larger your carbon footprint is, the more you are changing the planet, unfortunately, for the worse.

The carbon footprint is part of the ecological footprint, as a part of the carbon dioxide is absorbed by oceans and forest, which are bioproducer areas. Through the process of photosynthesis

oceans and forests capture carbon and release oxygen into the atmosphere. The carbon footprint is a large part of the ecological footprint and increases every day...

But what is its function? Through the carbon footprint, we can determine the impact we are causing on the atmosphere, provoking climate change with the increase in greenhouse gases.

Everything we do and consume generates an impact, which may be smaller or larger!

We currently talk about carbon credits or a certified emission reductions (CERs), which are certificates issued for a person or company that reduces the emission of greenhouse gases. By convention, one ton of CO₂ corresponds to one carbon credit.

CALCULATE YOUR CARBON FOOTPRINT:
www.iniciativaverde.org.br/calculadora/index.php

THE AIM OF THIS FOOTPRINT IS TO REDUCE GLOBAL WARMING, IMPROVE THE QUALITY OF LIFE OF THE PLANET, REDUCE THE ECOLOGICAL FOOTPRINT AND AVOID OVERLOADING THE EARTH.

Kids

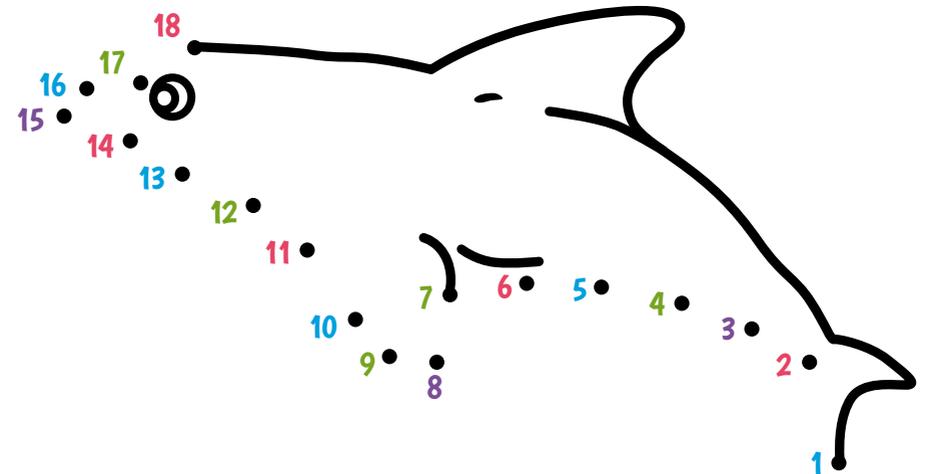
Here you will find games, origami and much more related to nature and aquatic life!

A really fun way to do environmental education with children.
You can choose the activity you want ...

Let's Play?

Let's connect the numbers!!

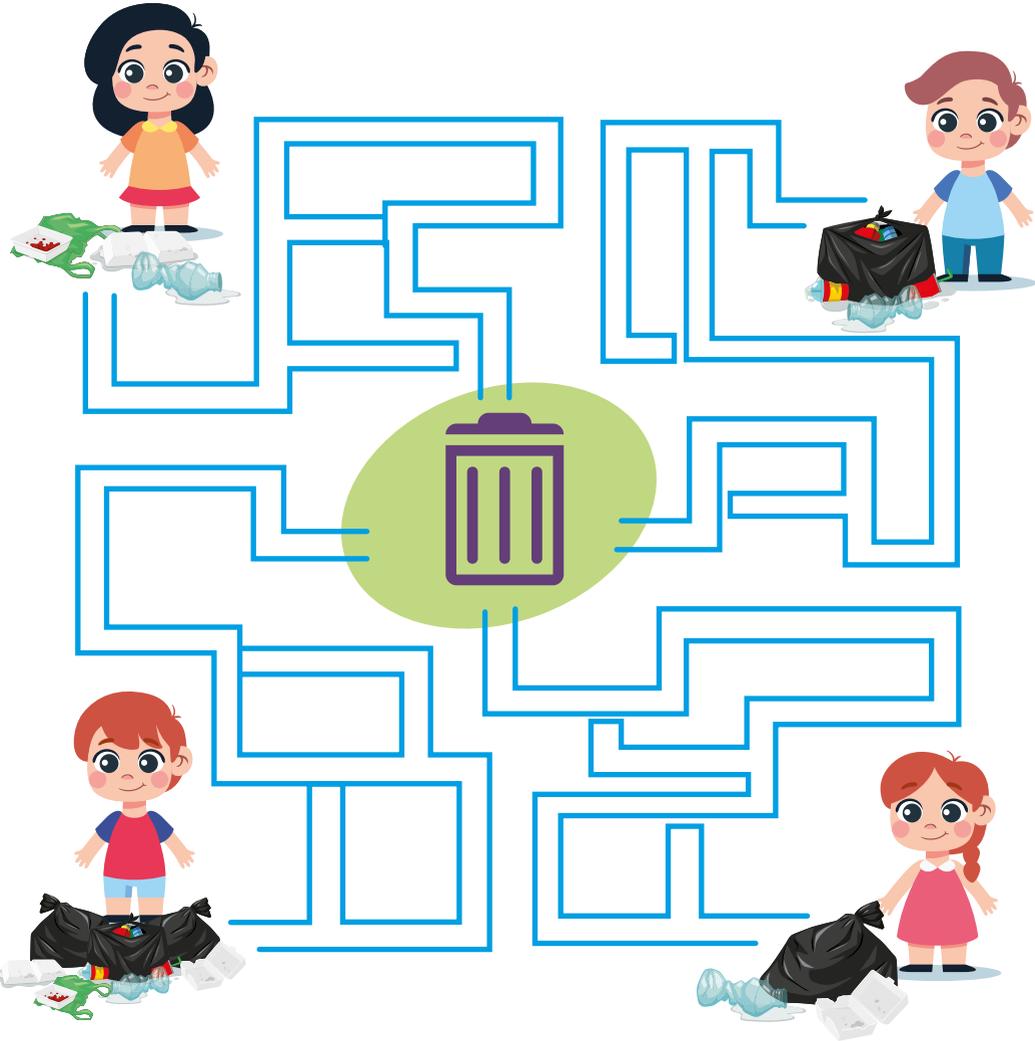
Let's connect the numbers and complete the animal.
Which animal did you draw? Now let's color it?



Maze Game

LET'S COLOR!

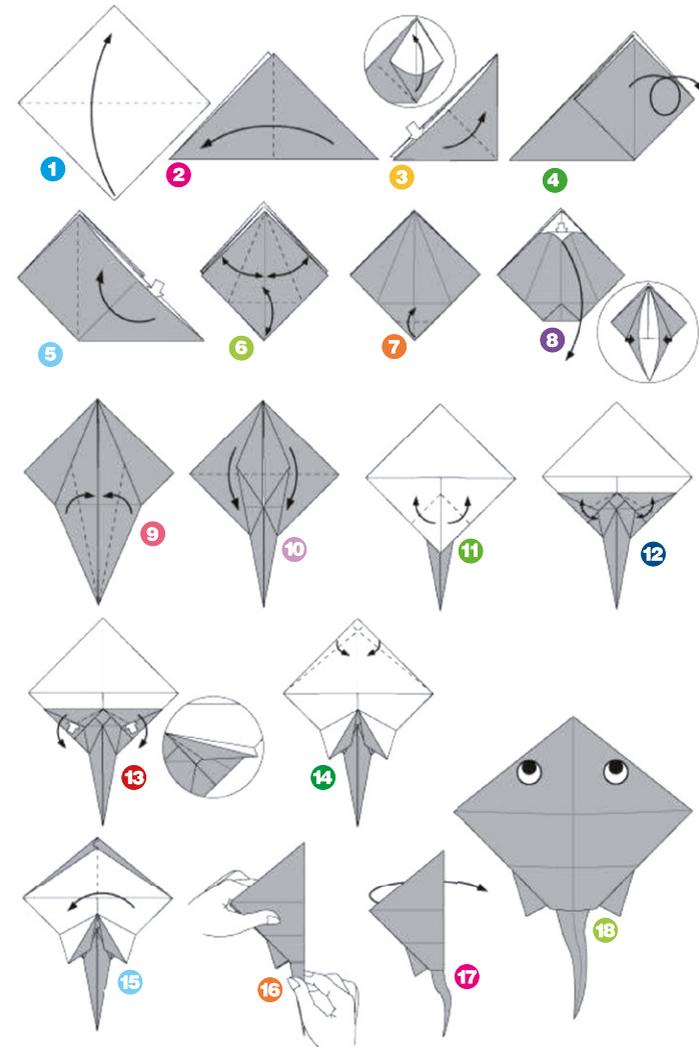
Let's help our little friends to put the garbage in the trash bin.
We should not throw garbage on the streets, on the beaches or in the lakes.
We must put the garbage in the trash bin!



Ray Origami

The ray is a fish (that's right, a fish!!!) that lives in the sea or in rivers and belongs to the family of sharks. The longest ray in the world can measure 7 meters in length and weigh more than 2 tons. Its long, thin tail has a stinger, but it only uses it when it feels threatened.

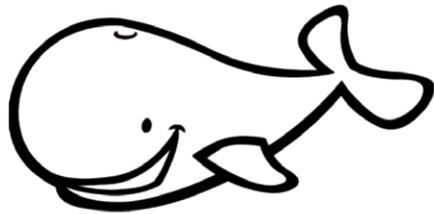
SHALL WE BUILD A RAY?



UNSCRAMBLE THE LETTERS TO MAKE A WORD THAT MATCHES THE PICTURE!

ENDANGERED ANIMALS

Color the endangered animals...
You need to help protect nature!!!



a w
L h
e



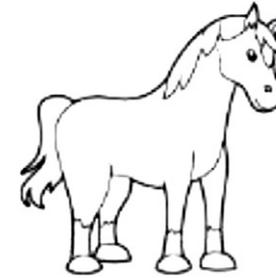
r
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q u
i s d



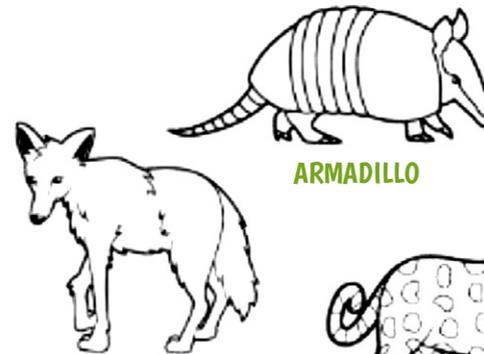
WOODPECKER



HORSE



CAT



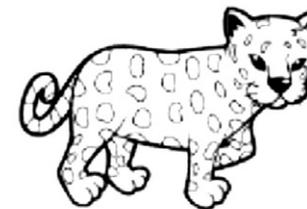
GUARÁ WOLF



ARMADILLO



WEASEL



JAGUAR



RABBIT



DOG



ANTEATER

Mascot

Do you know the iGui mascot?
He is dying to get into the pool, but he likes
colorful clothes Shall we color his clothes?

