

支持單位：



教育暨青年局  
Direcção dos Serviços de  
Educação e Juventude



民政總署  
INSTITUTO PARA OS  
ASSUNTOS CÍVICOS  
E MUNICIPAIS



環境保護局  
DIRECÇÃO DOS SERVIÇOS DE PROTECÇÃO AMBIENTAL



能源發展辦公室  
Gabinete para o Desenvolvimento  
do Sector Energético



主辦單位：



澳門生產力暨科技轉移中心  
C P T T M

為服務而發展 為發展而服務  
We serve to develop We develop to serve

兒童環保行動  Envirokids Program

第四階段行動記錄 Fourth Stage Workbook



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## 環境與我們

環保人士最關注的兩個環保議題。第一，二氧化碳排放造成的氣候變遷。碳足印就是排放到大氣中的二氧化碳數量與其他溫室氣體的數量。燃燒化石燃料，如天然氣、石油和煤，也會排放溫室氣體。



第二，海洋污染正威脅魚類及其他海洋生物，造成牠們的死亡，或使牠們的數量減少或體型縮小。而當人類進食受污染的海產時，健康最終會受到影響。

我們現在就要採取行動，以免問題在將來變得更難解決。



### 齊來動腦筋



1. 列出3種有助保護澳門環境的行為

項目	保護環境的行為	原因
1	種植及保護樹木。	樹木能吸收更多二氧化碳，以及它的根部能抓緊泥土，防止山泥傾瀉。
2		
3		

2. 列出3種會損害澳門環境的行為

項目	保護環境的行為	原因
1	因疏忽留下火種導致山火。	山火會摧毀長年種植的林木。
2		
3		

## 我們可做些甚麼？

每個人包括小孩都可以做些事來保護環境。首先，你要明白「碳足印」是甚麼，以及可以怎樣做，以減少「碳足印」。



這裡有兩個計劃（一個關於減少二氧化碳，見計劃一。另一個關於保護海洋，見計劃二。）。

你和你的同學可以選任何一個感興趣的題目。然後，按照下面的步驟，你、你的家人、同學和他們的家人就可以透過減少二氧化碳排放及保護海洋為環境保護出一分力。



### 小提示



你和你的同學要相信自己可以改善環境



### 行動

讓我們馬上建立一個計劃，以行動來保護環境吧！



### 小提示



按照我們提供的一個或多個活動例子去實踐環保。



## 我們可以怎樣做？

選擇一個計劃。



### 小提示

當你按照以下兩個計劃採取行動，你和你的同學就可以看到為環境保護作出多少貢獻。





## 明白碳足印：

### 1. 碳足印是甚麼？

碳足印是計算每個個體（當燃燒化石燃料、用電或交通等）所製造的二氧化碳量，以噸或公斤計算。



### 2. 你要怎樣做才能減少碳足印並同時節省金錢？

你和你的家人應關掉不需要使用的電器。減少用電、節省能源，你和你的家人就可以節省一點電費了。

你和你的家人應使用節約能源的環保電器。

你和你的家人應該改變耗電或浪費電力的生活習慣。



## 計劃一：減少二氧化碳

植物可以透過光合作用吸收二氧化碳，放出氧氣。植物的種類很多，包括有花、草藥、樹木和蔬菜。

漂亮的花朵可以為生活添上色彩。

草藥可以用來煮食和治療疾病。

蔬菜可以食用。

樹木：有些樹木可以結果，讓昆蟲、鳥類和小動物棲息，同時防止山泥傾瀉。



你可以在家裡或學校種植花朵和草藥，以及在政府指定場地植樹。這就是你和你的同學可以保護環境的方法。

### 例子：

發現問題：缺乏樹木



#### 小提示

為甚麼這是一個環保問題？

缺乏樹木會減少二氧化碳的吸收。

鳥兒和小動物沒有足夠的樹木棲身。

更多的樹木可以防止山泥傾瀉。



第一步：請你的家人和同學參加老師舉辦的校園植樹活動。



#### 小提示

為甚麼你和你的同學、你的家人要一同參加？

享受其中的樂趣，並保護環境。





**第二步：**你和你的同學可以學習植物的生命週期。

每棵大樹由種子長成。種子發芽後，長成幼苗，吸收陽光、水分、二氧化碳和泥土的養分，會長得越來越高大。樹木開花後，昆蟲們例如蜜蜂和蝴蝶就會吸吮花蜜。最後，有些樹木會結果，當果實被鳥兒和小動物吃掉後，果實的種子就會落到泥土裡。



**第三步：**參觀植樹的地方。

老師會安排你和你的家人、你的同學參加植樹活動。



**第四步：**按照指示植樹。

在植樹活動的地方，樹苗、鏟子和已挖的洞已準備妥當。你只要把樹苗放入洞裡，並按照指示覆上泥土。



**第五步：**把植好的樹苗數量加起來，計算樹木能長多高，以及要多久才能長高。

**第六步：**學習重點

我們要在郊野公園和指定的綠化地帶植樹。樹木需要專人打理，定期除害草，澆水和施肥。這是一個漫長的過程，因為樹木會不斷生長，而害草也會不停長出。

植樹的好處是預防山泥傾瀉，鳥兒和小動物可在樹上棲身，樹木亦可吸收二氧化碳。

我們可以享受優美的郊野公園和綠化地帶。



**第七步：**製作綠色環境宣傳海報

你可以設計環保宣傳海報，內容有關減少二氧化碳或節省能源（減少碳足印），以及分享你從計劃中學會的知識與經驗。





## 計劃二：保護海洋

**第一步：**想出一件日常生活中會破壞環境的事情。

發現問題：保持海洋清潔與美觀。



**第二步：**根據上述問題，訂出解決方案，這就是本計劃的目的。

**題目：**你和你的家人可以幫忙清理沙灘上的垃圾。切記要穿上環保團體建議的衣物和手套。



**第三步：**按照大人的指示，清理沙灘垃圾，並宣傳切勿亂拋垃圾的訊息和沙灘清潔的好處。你一定要遵照指示，不要遠離指定的地區，以免發生危險。



**第四步：**向環保團體詢問，在活動中所清理的垃圾種類和總重量。

1. 記下垃圾的種類。
2. 記下垃圾的重量。



**第五步：**啟示和學習重點



海洋對我們極為重要，所以我們要防止海洋被垃圾污染。如果沙灘上的垃圾沒有被清理乾淨，潮漲時海水就會把垃圾捲入海洋。我們要清理沙灘垃圾，舉報亂拋垃圾和宣傳「反亂拋垃圾」。

最重要的是我們要提醒旅客注重沙灘的環境和保護環境的責任，不要隨意亂拋垃圾。



**第六步：**製作清潔沙灘宣傳海報

你可以設計環保宣傳海報，內容有關減少沙灘及海洋污染，並分享你從計劃中學會的知識與經驗。



## ENVIRONMENT AND US

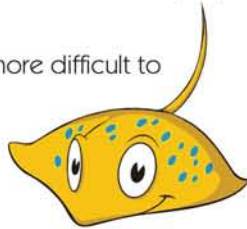
There are two issues that most environmentally-conscious people are concerned with. One of them is the emission of carbon dioxide that affects climate change. The carbon footprint is the amount of Carbon Dioxide and other Green House Gas (GHG) emitted into the atmosphere. The emission of Green House Gas (GHG) is often associated with the burning of fossil fuels, like natural gas, crude oil and coal.

The other is pollution in the sea that is affecting fishes and sea animals. Contamination will kill them, reduce their population or reduce their physical growth and sizes. Contamination of fishes and sea animals will eventually affect the health of people when they eat seafood.

We need to do something now; otherwise, it may be more difficult to rectify the problems in the future.



### LET'S BRAINSTORM



1. List 3 actions that will help to protect the environment in Macau.

Item	Helpful Actions	Reasons
1	Planting and protecting trees.	Absorbing more carbon dioxide and holding the soil to avoid landslide.
2		
3		

2. List 3 actions that will hurt the environment in Macau.

Item	Harmful Actions	Reasons
1	Reckless wildfire as a result of carelessness.	Destroying plants that took years to grow.
2		
3		

## WHAT CAN WE DO?

Everyone including kids can do something to save the environment. First, you have to understand what "carbon footprint" is and what you can do to reduce them.



There are two projects (one is for reducing carbon dioxide, see Project 1, and the other is for protecting the sea, see Project 2).

You and your classmates can choose any of the topics that you are interested in. Then, follow the steps for each project that you, your family, your classmates and their families can contribute in protecting our environment by reducing the amount of carbon dioxide or protecting the sea.



### USEFUL TIPS

You and your classmates have to believe that all of you can improve the environment.



### ACTION

Let's work out a plan and do something now to help protect our environment NOW.



### USEFUL TIPS



Follow one or more projects provided.



## HOW CAN WE MAKE A DIFFERENCE?

Choose a topic



### USEFUL TIPS

By following our 2 projects provided, at the end of the day, you and your classmates can see how much all of you can contribute to our environment.






## UNDERSTANDING CARBON FOOTPRINT:

### 1. What is a carbon footprint?


The carbon footprint is a measurement of all greenhouse gases that an individual produces (such as burning fossil fuels, electricity consumption and transportation) in the unit of tonnes (or kg) of carbon dioxide equivalent.



### 2. How could you reduce your carbon footprint and save money as well?

 You and your family members should switch off electrical and electronic appliances when they are not in use. The less energy you and your family members consume, the cheaper your electricity bill will be.







 You and your family members must use environmental -friendly appliances that consume less energy.

 You and your family members must change any habit of over using or wasting energy.



## PROJECT 1: ELIMINATING CARBON DIOXIDE

Plants can absorb carbon dioxide through photosynthesis and emit oxygen. There are many types of plants: flowers; herbs; trees and vegetables.

-  Flowers can brighten our lives because they are beautiful to look at.
-  Herbs can be used for cooking and/or medical purposes.
-  Vegetables are for eating.
-  Trees: Some trees can provide fruits, shelter and home for insects, birds and small animals as well as preventing landslide.



You can grow flowers and some herbs in your home or school and plant trees in Government designated areas. This is an example of what YOU and your classmates can DO to save our environment.

### FOR EXAMPLE:




Identified issue / problem: Lack of trees



### USEFUL TIPS



#### • Why is it an environmental problem?

-  Lack of trees means a smaller amount of carbon dioxide will be absorbed.
-  Lack of trees will deprive birds and small animals of shelter.
-  More trees will minimize landslide.



**Step 1:** Persuade your family members and your classmates and their families to join the school tree planting event arranged by the teacher.



### USEFUL TIPS



#### • Why should you, your classmates and families participate?

-  Have fun and also save the environment





**Step 2:** You and your classmates can learn the life cycle of a plant indicated below.

Every large tree started off from a tiny seed. The seed germinates into a small plant, which gradually grows taller and bigger with sunshine, water, nutrients from the soil and carbon dioxide. The tree will flower where insects such as bees and butterflies will suck the nectar in the flowers. Eventually, some trees will bear fruits where they will be eaten by birds and small animals. The seeds are then dropped off onto the soil.



**Step 3:** Visit to tree planting location.

The teacher will arrange for you, your family and your classmates to participate in tree .



**Step 4:** Plant trees as instructed.

Small trees, shovels and already dug holes are prepared for you. You just have to put the tree into the hole and cover it with soil as instructed.



**Step 5:** Add up the total of trees planted and find out how tall the trees can grow and how long it takes for them to grow to that size.



**Step 6:** Implications and lessons learned

We need to plant trees in our country park and designated green area. These plants would need workers to maintain through removing both weeds and suffocating plants, watering and fertilizing. This is a lengthy process because trees grow for many years and so are the weeds and suffocating plants.

The long term benefit is that the soil is protected against landslide, providing home and shelter for birds and small animals as well as absorbing CO<sub>2</sub>.

We can enjoy the splendor in our country park and designated green area.



**Step 7:** Creating "green" environment poster

You may draw a poster on how we can improve our environment by reducing CO<sub>2</sub> or the consumption of energy (reducing carbon footprint) and use the information and experience gained from your project.





## PROJECT 2: PROTECTING OUR SEA

**Step 1:** Think of an issue in your daily life that upsets our environment.  
Identified issue / problem: Keep the sea clean and tidy



**Step 2:** Based on the problem identified, define what you can do to tackle the issue, which is the aim of this project.

**Topic:** You and your family members can assist with clearing of rubbish and debris discarded or washed on the beach. Make sure that you wear protective clothing and gloves as recommended by environmental groups.



**Step 3:** Follow the instructions that adults have drawn up to conduct clearing of rubbish and debris, and to promote anti-littering and the benefits of a clean beach and sea. It is extremely important that all of you must follow the instructions and not wander outside the designated area for safety reasons.



**Step 4:** Find out from the environmental group about the different types of rubbish and debris found as well as their total weight.

- Write down each type of rubbish and debris found.
- Write down the weight of rubbish and debris collected.



**Step 5:** Implications and lessons learned



The sea is extremely important to all of us and we need to keep rubbish and debris away from the sea. The rubbish and debris on the beach must be collected; otherwise, high tide will push them into the sea. We all need to contribute in collecting, reporting and promoting anti-littering.

The most important thing is to remind the users to be more responsible and respectful of our environment by not discarding litter.



**Step 6:** Creating "clean" beaches poster

You may draw a poster on how we can improve our environment by reducing the pollution on the beach and in the sea and use the information and experience gained from your project.