



## 共生世界多面睇 (下花山) The Symbiotic World (Ha Fa Shan)

姓名 Name

組別 Group

日期 Date:

### 學習目標 Learning goals:

完成課程後，學生應能 After the course, students should be able to:

1. 描述和解釋生物之間的各種關係 Describe and explain the different types of relationships between organisms;
2. 使用數量錐體和生物量錐體來表達生物間的攝食關係及各營養級的能量流 use pyramid of numbers and biomass to represent the feeding relationships between and energy flow between different trophic levels;
3. 辨認和分類一些本港常見生物品種 identify and classify some common species in Hong Kong;
4. 對生物行為和外在外特徵進行深入觀察 do comprehensive observation of the external features and behaviour of living organism;
5. 與他人合作進行考察和資料整理工作 cooperate with others to do field investigation and data processing;
6. 製作簡單科學報告 make simple scientific report;
7. 欣賞大自然之美和尊重生物 appreciate the wonder of nature and respect living things.

### 程序 Schedule

9:15 - 09:45	簡介 Briefing
09:45 - 12:00	考察 Field work
12:00 - 13:00	午膳 Lunch
13:00 - 13:45	顯微鏡觀察 Microscopic observation
13:45 - 15:30	資料整理 Data processing
15:30 - 16:15	分組匯報 Group presentation
16:15 - 16:30	討論及總結 Discussion & summary

### 儀器和工具 Equipment and tools

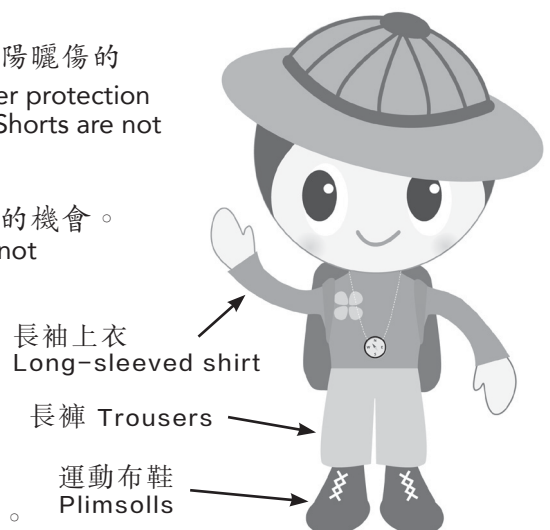
1	寫字夾板 Clipboard	
2	平板電腦/數碼相機 Tablet computer/Digital camera	
3	雙筒望遠鏡 / 微距望遠鏡 Binocular/Macroscope	
4	膠袋 Plastic bags	
5	圖鑑 Pictorial Guides	

### 衣著 Clothing:

1. 穿著長袖上衣和長褲能更有效防止蚊蟲叮咬，亦可減低被太陽曬傷的機會，不應穿著短褲。 Long-sleeved shirt and trousers for better protection against mosquito and insect bites, as well as preventing sunburn. Shorts are not recommended.
2. 不應穿著拖鞋或涼鞋，而應穿著運動布鞋，以減低腳部受傷的機會。 A pair of plimsolls for preventing injuries. Slippers and sandals are not recommended.

### 安全 Safety:

1. 避免踏足陡斜和濕滑的岩石和泥土表面。  
Avoid stepping on steep and wet rock surfaces and soil surfaces.
2. 切勿闖入植物生長茂密的地方，以免觸及蜂巢或被植物割傷。  
To prevent being attacked by wasps from disturbed wasp nests or being injured by plant leaves and thorns, do not get into places with dense vegetation.



## 深入觀察共生生物 Comprehensive observation of symbiotic living organisms

沿途尋找和深入觀察下列 5 對共生生物，在可行情況下，拍攝相片和影片。

Along the survey route, find the following 5 pairs of symbiotic living organisms and do comprehensive observation. Take photo and video records whenever possible.

### 1. 吹綿蚧和血桐 Mealybug and Elephant's Ear (a tree)

涉及的生物名稱 Name of involved living organisms	
涉及的生物的形態特徵和行為 Morphological features and behaviour of the involved living organisms	
生物之間的關係概述 Brief description of the relationship between the living organisms	
共生關係類型 Type of relationship	

### 2. 無根藤/菟絲子與植物 Cassytha/Dodder and plant

涉及的生物名稱 Name of involved living organisms	
涉及的生物的形態特徵和行為 Morphological features and behaviour of the involved living organisms	
生物之間的關係概述 Brief description of the relationship between the living organisms	
共生關係類型 Type of relationship	

### 3. 黃猄蟻與植物 Red Weaver Ant and plant

涉及的生物名稱 Name of involved living organisms	
涉及的生物的形態特徵和行為 Morphological features and behaviour of the involved living organisms	
生物之間的關係概述 Brief description of the relationship between the living organisms	
共生關係類型 Type of relationship	

### 4. 螞蟻與蚜蟲 Ants and Aphids

涉及的生物名稱 Name of involved living organisms	
涉及的生物的形態特徵和行為 Morphological features and behaviour of the involved living organisms	
生物之間的關係概述 Brief description of the relationship between the living organisms	
共生關係類型 Type of relationship	



## 5. 其他生物 Other organisms

涉及的生物名稱 Name of involved living organisms	
涉及的生物的形態特徵和行為 Morphological features and behaviour of the involved living organisms	
生物之間的關係概述 Brief description of the relationship between the living organisms	
共生關係類型 Type of relationship	

## 其他共生生物實例 Other examples of symbiotic living organisms

找尋更多的共生關係實例，並用與上述同樣的方法記錄。

Search for more real examples of symbiotic relationships, use the same methods as above to do records.

## 一棵樹上的生物 (延伸活動) Living organisms on a tree (Extended activity)

找尋一棵有較多小生物的樹，仔細尋找樹上每種生物，記錄數量與及生物和樹之間的關係。

Find a tree with more small living organisms on it, carefully search for every species on the tree, record the number of each species and the relationship of each species with the tree.

生物名稱 Name of the living organism	個體數量 Number of individuals	生物之間的關係概述 Brief description of the relationship between the living organisms

## 問題討論

### *Discussion*

#### 1. 詳細報告 A detailed report

選擇其中一對共生生物，詳細展述和解釋當中的關係。

Choose a pair of symbiotic living organisms, describe and explain their relationship in detail.

#### 2. 相同與不同 Similarities and differences

比對各個實地觀察到的生物關係，描述和解釋相同和不同之處。

Compare and contrast the real examples of symbiotic relationship observed in the field. Describe and explain the similarities and differences.

#### 3. 攝食關係和能量流 Feeding relationships and energy flow

利用食物鏈、食物網、數量錐體來表達一棵樹和其他生物之間的攝食關係和各營養級的能量流。

Use a food web, pyramids of numbers and biomass to represent the feeding relationships between a tree and the small living organisms on it as well as the energy flow between different trophic levels.