

自然科學部分雙語課程設計

單元名稱	第一單元-1-1 菜園大發現		
領域類別	自然科學	教案設計	郭婉容
教學對象	三年級	教學節次	2 節/每節 40 分鐘
教材來源	翰林三年級自然科學		
教學目標	<ol style="list-style-type: none"> 1. 引導學生察覺，餐桌上的蔬菜是由從農地種植而來。 2. 能分享認識的蔬菜外型、味道，並能辨別常見的蔬菜。 3. 藉由觀察菜園環境，了解種植蔬菜需要考慮的各種環境因素。 4. 植物需要陽光、空氣、水、空間、營養、土壤等條件來維持生長。 		
學習內容	INa- II-7 生物需要能量（養分）、陽光、空氣、水和土壤，維持生命、生長與活動。		
學習表現	po- II-1 能從日常經驗、學習活動、自然環境，進行觀察，進而能察覺問題。		
核心素養	自-E-A1 能運用五官，敏銳的觀察周遭環境，保持好奇心、想像力持續探索自然。		
議題融入	戶外教育 E3 善用教室外、戶外及校外教學，認識生活環境（自然或人為）。		
學科英語	蔬菜 vegetable、環境 environment、陽光 sunlight、空氣 air、水 water、土壤 soil、空間 space、肥料 fertilizer、營養 nutrient		
教學活動		教學資源	評量方式
活動一：認識蔬菜及其生長環境(兩節課) 引起動機：(5') 昨天的營養午餐吃了什麼？ 有哪些蔬菜？ T: What did you have for lunch yesterday? Ss: Meat/ Vegetables/ Free response. T: What kinds of vegetables did you have? Ss: 洋蔥/小白菜/ 蔥/蒜/青菜/ 紅蘿蔔/ Free response. 發展活動：(63') 1. 認識常見蔬菜。 T: Here' s our school lunch menu. Do you know all these kinds of vegetables? Ss: Yes, .../ No, T: What other vegetables do you know? Ss: 茼蒿/ 苦瓜/冬瓜/小黃瓜/ 筍子/ Free response. T: Let' s look at some pictures of vegetables, can you recognize them? Ss: Yes, it is.../ No. T: This is.../ That is... Ss: (學生根據圖片回答蔬菜/猜測是什麼蔬菜。) T: Where can you find these vegetables?		營養午餐菜單 營養午餐菜單 ppt youtube 圖片	口頭評量 口頭評量

<p>Ss: Super market/ 農田/ Free response. T: How can we get it? Ss: 去超市買/去菜園摘/Free response. T: It' s convenience for us to buy it at market or super market. Where do these vegetables grow? In the city or in the country? Ss: In the country/ 農田/菜園/ 空間大的地方/Free response. T: We live in city, so how can we get these vegetables? Ss: 從農田採收經過處理後，再載到城市賣/Free response. T: That' s right! Vegetables will be packaged and then be transported to the market in different cities.</p> <p>2. 蔬菜的生長環境。</p> <p>T: Most vegetables grow in vegetable garden. What kind of environment do vegetables need to grow the best? Ss: 有足夠的空間/ Water/ Sunlight/ Soil/ Free response. T: Let' s watch the video. Observe what' s in vegetable garden, and what do vegetables need. T: What do you see in this video? What do vegetables need? Please discuss with your group members and write down your answers on white board. You have 5 minutes. Each group will present your answer in front of whole class. T: Now it' s time to present, let' s start with group... Ss: Water/ Sunlight/ Soil/ 空間/ 肥料/蚯蚓/Free response. T: As we could see, all groups have some answers in common. That would be water, sunlight, and soil. T: There' s one important thing for both animals and plants, but you can' t see it, what' s that? Ss: Air. T: Also, there' s one more thing that plants need. We knew that all matters take up space. Plant is one kind of matters, so they need space to grow. T: Most vegetables need water, sunlight, air, space and soil. But, do all the vegetables grow in soil? Ss: No, some of them grow in water. T: So, the most important things that vegetables or plants need, actually is the nutrients in soil and water. T: In the video, what are those bags on the side?</p>	<p>影片 ppt 小白板 白板筆</p>	<p>口頭評量</p>
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<p>Ss: 肥料。</p> <p>T: Sometimes we use fertilizer to help plants to get the nutrients they need. There are two kinds of fertilizer. One is organic fertilizer, and another one is chemical fertilizer. Let' s take a look at p.13 to know better about organic fertilizer and chemical fertilizer.</p> <p>綜合活動: (12')</p> <p>1. 分享喜歡/不喜歡什麼菜? 吃起來味道如何?</p> <p>T: What vegetable do you like? / What vegetable do you dislike?</p> <p>Ss: I like.../ I dislike...(學生依據他們的喜好分享)</p> <p>T: How does it taste?</p> <p>Ss: Good/ Bad/ 爛爛的/ 苦苦的/ Free response.</p> <p>T: It' s fine that everyone has different preference. Just make sure you eat some vegetables to keep health.</p> <p>2. 結論:蔬菜(植物)生長需要陽光、空氣、水、營養和空間。</p> <p>T: In conclusion. What do vegetables (plants) need to grow?</p> <p>Ss: Sunlight, air, water, nutrients(soil), and space.</p>	<p>習作 p.2</p>	<p>口頭評量</p> <p>口頭評量</p>
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自然科學部分雙語課程設計			
單元名稱	第一單元-1-2 種植日記		
領域類別	自然科學	教案設計	郭婉容
教學對象	三年級	教學節次	9 節/每節 40 分鐘
教材來源	翰林三年級自然科學/陽交大 DIY Green/自編學習單		
教學目標	<ol style="list-style-type: none"> 1. 引導學生查詢並閱讀種植蔬菜的資料，並且能整理出所需資訊。 2. 進行種菜前的規劃與預備，並實際進行播種。 3. 進行實際種植蔬菜，並且能記錄蔬菜的生長變化。 4. 透過實作探討環境對蔬菜生長的影響，察覺植物的生長與水、陽光有關。 5. 透過探討與實作，解決蔬菜生長的問題。 6. 認識蔬菜的生長歷程及採收方法。 		
學習內容	INa-II-7 生物需要能量(養分)、陽光、空氣、水和土壤，維持生命、生長與活動。 INd-II-3 生物從出生、成長到死亡有一定的壽命，透過生殖繁衍下一代。 INe-II-11 環境的變化會影響植物生長。		
學習表現	pe-II-2 能正確安全操作適合學習階段的物品、器材儀器、科技設備及資源，並能觀察和記錄。		

	<p>pc-II-2 能利用簡單形式的口語、文字或圖畫等，表達探究之過程、發現。</p> <p>ai-II-3 透過動手實作，享受以成品來表現自己構想的樂趣。</p> <p>an-II-1 體會科學的探索都是由問題開始。</p>
核心素養	自-E-B2 能了解科技及媒體的運用方式，並從學習活動、日常經驗及科技運用、自然環境、書刊及網路媒體等，察覺問題或獲得有助於探究的資訊。
議題融入	<p>資訊教育</p> <p>E2 使用資訊科技解決生活中簡單的問題。</p> <p>閱讀教育</p> <p>E5 發展檢索資訊、獲得資訊、整合資訊的數位閱讀能力。</p> <p>E10 中、高年級：能從報章雜誌及其他閱讀媒材中汲取與學科相關的知識。</p> <p>生命教育</p> <p>E17 意志貫徹力。</p>
學科英語	<p>生長季 growing season、種植 plant、種子 seed、土 soil、鏟子 shovel、花盆 flowerpot、澆水器 watering can、紗網 gauze、撒播 broadcast sowing、點播 spot seeding、收成 harvest、生命週期 life cycle、開花 blossom</p>

教學活動	教學資源	評量方式
<p>活動一：種植前的準備。(兩節課)</p> <p>引起動機：(5')</p> <p>之前學到植物需要陽光、空氣、水、空間和營養才能生長，請問，不論何時播種，都能讓植物生長的好嗎？</p> <p>T: We learned that plants need sunlight, air, water, space, and nutrients to grow. Can you plant it anytime you want? Will it grow as you wish?</p> <p>Ss: 不行, 要看季節/Free response.</p> <p>T: That' s right. Different plants have different growing season.</p> <p>發展活動：(65')</p> <p>1. 認識蔬菜種子及其生長季。</p> <p>T: What vegetable do you want to plant?</p> <p>Ss: 小白菜/番茄/菠菜/空心菜/Free response.</p> <p>T: We are going to plant these vegetables from March to April. Are March and April the best growing season for the vegetable you choose?</p> <p>Ss: I don' t know/ Yes, .../ Free response.</p> <p>T: Please use iPad to find out what is the best growing season and the environment for the vegetable you choose. If March and April are not the best growing season for the vegetable you chose, please choose another vegetable to plant.</p>	iPad	<p>口頭評量</p> <p>口頭評量</p> <p>實作評量</p>

<p>T: Now, do you know when is the best growing season and the environment for the vegetable you choose?</p> <p>Ss: Yes, ...</p> <p>T: Let' s take a look about the seeds of these vegetables that you choose. We have 小白菜、番茄、菠菜、油菜、空心菜、莧菜……。How does the seed look like? When you touch it, how does it feel like?</p> <p>Ss: (根據他們的感受進行回答)</p>	<p>種子 ppt</p>	<p>口頭評量</p>
<p>2. 種植工具及播種方式。</p> <p>T: We are going to plant the vegetables, what tools or things do we need? Why?</p> <p>Ss: water, 植物需要水才能生長/ 土, 要種在土裡/ 鏟子, 鬆土、挖洞/ 花盆, 把植物種在裡面/ 澆水器, 澆水/ 石頭, .../ 紗網, .../ Free response.</p> <p>T: When we use watering can to water the plants, should you water on the top of the plant, or on the soil?</p> <p>Ss: On the soil.</p> <p>T: That' s right. You have to water it slowly and gently; otherwise too much water at the same time will flush the seeds and soil away. Also, what time should you water the plants? In the morning? At noon? Any other ideas?</p> <p>Ss: In the morning/ In the afternoon/ Free response.</p> <p>T: Can we watering at noon?</p> <p>Ss: No, .../ Yes, .../ Free response.</p> <p>T: We don' t water at noon, because that will made the plants die sooner.</p> <p>T: Why do we need gauze?</p> <p>Ss: 因為花盆下面有洞, 沒有紗網澆水的時候土會流出去。</p> <p>T: Great! Gauze can help us keeping the soil in the flowerpot.</p> <p>T: Why do we need rocks?</p> <p>Ss: 放在花盆底部, 讓多餘的水可以流出去。</p> <p>T: Excellent. When there' s too much water, the roots will rot, so we have to put rocks at the bottom of flowerpot.</p> <p>T: On the seeds wrapping, there are 2 different ways to spread the seeds. What are they? What' s the difference between them?</p> <p>Ss: 點播, 種子比較大顆/ 撒播, 種子比較小顆/ Free response.</p>	<p>種子 土 蚓肥 鏟子 花盆 紗網 不織布線 澆水器</p>	<p>口頭評量</p>

<p>T: Broadcast sowing is for bigger seeds, it will grow into bigger size. It will have less seeds so it will be more expensive. Spot seeding is for smaller seeds that it's hard to plant only one seed at a time. It will have more seeds so the price is cheap.</p> <p>綜合活動：(10')</p> <p>1. 完成習作。 Finish the workbook.</p> <p>2. 統整:種植所需-種子、土、鏟子、花盆、紗網、不織布線、蚓肥、澆水器，及種植時須注意的事項。</p> <p>T: Let's make a conclusion. What tools or things do we need to plant the vegetables?</p> <p>Ss: We need seeds, soil, shovels, flower pots, watering cans, gauze, organic fertilizer, and strings.</p> <p>T: What is the better time to plant the seeds?</p> <p>Ss: Its growing season.</p> <p>T: How do we water the plants and when should we water it?</p> <p>Ss: Water on soil/ 慢慢澆水/中午不能澆，其他時間皆可。</p>	<p>習作 p. 3-4</p>	<p>口頭評量</p>
<p>活動二:播種囉!當個快樂小農夫。(五節課)</p> <p>發展活動：(180')</p> <p>1. 種蔬菜囉!</p> <p>T: Last period we talked about how to plan the vegetables. Now we are going to do it. Can you tell me what are the steps? Please match it.</p> <p>* Prepare all things we need. (Seeds, soil, shovel, flowerpot, watering can, gauze, strings, and organic fertilizer.)</p> <p>* Use those 2 strings across the holes in flower pot.</p> <p>* Put the strings on the edge of flower pot, and then put the gauze in.</p> <p>* Mix the soil and organic fertilizer, also loosen the soil.</p> <p>* Put soil in half of box first. Then drop the strings on the edge of box. Put more soil in, make sure soil do cover the strings.</p>	<p>ppt 種子 土 蚓肥 鏟子 花盆 紗網 不織布線 澆水器</p>	<p>口頭評量</p> <p>實作評量</p>

* Broadcast sowing /Spot seeding.

* Cover a layer of soil.

* Watering.

Ss: 先準備好所有工具。(Prepare all things we need.)

T: What things do we need?

Ss: 種子、土、鏟子、花盆、紗網、不織布線

、蚓肥、澆水器、寶特瓶。(Seeds, soil, shovels, flower pots, watering cans, gauze, organic fertilizer, bottles, and strings.)

T: What' s next?

Ss: 將不織布繩子穿過花盆的洞洞。(Use those 2 strings across the holes in flower pot.)

T: What should we do after that?

Ss: 繩子扣在花盆上方邊邊，將紗網放在底部。(Put the strings on the edge of flower pot, and then put the gauze in.)

T: Strings can keep soil moist, and gauze is to avoid losing the soil.

T: What' s next?

Ss: 將土和蚓肥混合並鬆土。(Mix the soil and organic fertilizer, also loosen the soil.)

T: What' s next?

Ss: Put soil/先裝一半的土，把不織布繩子放下，再裝土蓋過繩子。(Put soil in half of box first. Then drop the strings on the edge of box. Put more soil in, make sure soil do cover the strings.)

T: Make sure you only put soil in half of box first. Then drop the strings. Then, put more soil in, make sure soil do cover the strings.

T: What should we do next?

Ss: 撒種子。(Broadcast sowing /Spot seeding.)

T: We have two ways to put seeds in soil. Broadcast sowing and spot seeding. What kinds of seeds works for broadcast sowing?

Ss: 種子很小的/ 種子很多的/ Free response.

T: What kinds of seeds works for spot seeding?

Ss: 種子比較大的/ 種子比較少的/ Free response.

T: If you forget the best planting way for your seeds, you may also check the seeds wrapping. What' s next?

習作 p. 5

<p>Ss:再鋪上一層土把種子蓋住。(Cover a layer of soil.) T: Remember don' t cover too much soil on seeds. What' s the last step? Ss: Watering. T: That' s right! Let' s do it together, step by step.</p> <p>Step1: Prepare all things we need. (Seeds, soil, shovel, flowerpot, watering can, gauze, strings, bottles, and organic fertilizer.) Step2: Use those 2 strings across the holes in flower pot. Step3: Put the strings on the edge of flower pot, and then put the gauze in. Step4: Mix the soil and organic fertilizer, also loosen the soil. Step5: Put soil in half of box first. Then drop the strings on the edge of box. Put more soil in, make sure soil do cover the strings. Step6: Broadcast sowing /Spot seeding. Step7: Cover a layer of soil. Step8: Watering.</p> <p>2. 紀錄蔬菜的生長。 T: We are going to make the growing record of your vegetable. Why do we need to observe how it grows? Ss: 知道它的生長速度/知道多久可以收成/ 了解它的生長過程/ Free response. T: That would be all the reasons why we need to record it. Also, if your plants are not growing well, we can look at the data and try to find out what happened. Once we know the reason, then we could fix it. T: How can we record its growing? Ss: Use 5 senses/ 用尺測量/ 拍照/ Free response. T: What data should we record? Ss: 時間/ 日期/ 天氣/ 高度/ 畫出它的樣子/ Free response. T: Great. We are going to record the data on Monday and Friday-for 6 weeks.</p> <p>3. 解決蔬菜生長時遇到的問題-葉枯黃、彎一邊、太密集、蟲害。</p>	<p>習作 p. 6</p> <p>學習單</p> <p>蔬菜盆栽 iPad 園藝書籍 學習單 習作 p. 7</p>	<p>口頭評量</p> <p>實作評量</p> <p>口頭評量</p> <p>實作評量</p>
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<p>T: While the vegetables are growing, what have you noticed?</p> <p>Ss: 我的葉子垂下來黃黃的/我的長得密密麻麻,但別人的菜長得比較高/我們的都長得歪歪的/我的葉子被蟲吃掉了/ Free response.</p> <p>T: Since we notice the problems, then we are going to find out the solution by using scientific method. Let' s solve those problems one by one.</p> <p>(1) 葉枯黃</p> <p>T: You had observed that leaves are hanging down and its color turns yellow. Why did it happen? Please do the research by iPad or look through the books.</p> <p>T: Now you have done the research, what might cause the leaves hanging down and its color turns yellow?</p> <p>Ss: 缺水/ Free response.</p> <p>T: Your hypothesis is that when vegetables lacks of water, the leaves will hang down and its color turns yellow. Then we have to do the experiment to find out whether that' s true. What should we do?</p> <p>Ss: 拿兩盆相同的蔬菜盆栽,一盆澆水,另一盆不澆水,看不澆水的那盆是不是葉子真的會垂下來,並且變成黃色。</p> <p>T: We also have to record how it changes. Please observe it every other day.</p> <p>T: After the experiment, what did we observe?</p> <p>Ss: 沒有澆水的葉子垂下、枯黃,最後死掉;有澆水的繼續生長。</p> <p>T: What have we learned from this experiment?</p> <p>Ss: 植物需要水分才能生長,沒有足夠水分的話,葉子會垂下,最後枯黃死亡。</p>	<p>蔬菜盆栽 iPad 園藝書籍 紙箱 剪刀 學習單 習作 p. 8</p>	<p>實作評量</p>
<p>(2) 彎一邊</p> <p>T: You had observed that vegetables are not straight up but lean to one side. Why did it happen? Please do the research by iPad or look through the books.</p> <p>T: Now you have done the research, what might cause the vegetables not growing straight up but leaning to one side?</p> <p>Ss: 朝向陽光生長/ Free response.</p>	<p>蔬菜盆栽 iPad 園藝書籍 鑷子 學習單 習作 p. 9-10</p>	<p>實作評量</p>

<p>T: Your hypothesis is that vegetables will grow towards the sunlight. Then we have to do the experiment to find out whether that's true. What should we do?</p> <p>Ss: 拿兩盆相同的蔬菜盆栽，一盆放在陽光下，另一盆拿紙箱挖洞後蓋住，讓紙箱挖洞處朝向右方，看挖洞的那盆是不是真的都向右長。</p> <p>T: We also have to record how it changes. Please observe it every other day.</p> <p>T: After the experiment, what did we observe?</p> <p>Ss: 紙箱挖洞處朝向右方的蔬菜盆栽，盆栽裡的蔬菜通通向右生長! 沒有紙箱蓋住控制方向的蔬菜盆栽，則往上長。</p> <p>T: What have we learned from this experiment?</p> <p>Ss: 植物需要陽光，並會朝向陽光生長。</p> <p>(3)太密集</p> <p>T: You had observed that vegetables are too close to each other and that makes it grows shorter. Why did it happen? Please do the research by iPad or look through the books.</p> <p>T: Now you have done the research, what might cause the vegetables too close to each other and that makes it grows shorter?</p> <p>Ss: 播種的太靠近/ 撒太多種子/ 太多蔬菜空間不夠/ 太多蔬菜導致養分、水分不夠/ Free response.</p> <p>T: Your hypothesis is that your vegetables are shorter than others, because they are too close to each other. They need more space. Then we have to do the experiment to find out whether that's true. What should we do?</p> <p>Ss: 拿兩盆相同的蔬菜盆栽，一盆不動它，讓它繼續密密麻麻生長，另一盆拿鏟子拔除長得比較差的菜苗，給它多一點空間，看是不是真的會長得比較好。</p> <p>T: We also have to record how it changes. Please observe it every other day.</p> <p>T: After the experiment, what did we observe?</p> <p>Ss: 拔除長得比較差的菜苗、擁有比較多空間的盆栽，後來開始長高、長大。種的密密麻麻的盆栽，蔬菜的生長沒有明顯變化。</p> <p>T: What have we learned from this experiment?</p> <p>Ss: 植物需要足夠的空間，以利他們生長。</p> <p>(4)蟲害</p> <p>T: You had observed that caterpillars ate</p>	<p>蔬菜盆栽 iPad 園藝書籍 辣椒水 軟毛刷 防蟲網 學習單 習作 p. 11</p> <p>習作 p. 7-11</p>	<p>實作評量</p> <p>口頭評量</p>
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<p>vegetables' leaves. What could you do to prevent it? Please do the research by iPad or look through the books. T: After you do the research, what could you do to prevent vegetables been eaten by caterpillars? Ss: 用軟毛刷移除毛毛蟲/戴手套把昆蟲抓走/噴農藥/自製天然辣椒水當驅蟲劑/用紗網和棍子架設防蟲網/Free response. T: Let' s do it to protect our vegetables.</p> <p>綜合活動: (10')</p> <p>1. 結論:為什麼我們需要找出影響蔬菜生長的問題? 因為找到解決方法後,可以讓蔬菜長得更好。下次也可以事先預防,讓蔬菜長得更好。 T: Why do we need to find out what affects vegetables growth? Ss: 可以讓蔬菜長得更好/下次也可以事先預防相同問題/ Free response. T: 失敗為成功之母,我們可以藉由每一次經驗獲得科學知識,並讓我們下次能夠表現得更好!</p> <p>2. 完成習作。 T: Finish the workbook.</p>	<p>iPad</p>	<p>口頭評量</p> <p>口頭評量</p>
<p>活動三:豐收啦!認識蔬菜的一生。(兩節課)</p> <p>引起動機: (5') 蔬菜可以收成了嗎? 怎麼判斷? T: How do you know when is the best time to harvest vegetables? Ss: 蔬菜已經長到最大了,所以可以收成了/ 已經過一個多月了,到了種子包裝上建議的收成時間/ Free response.</p> <p>發展活動: (60')</p> <p>1. 蔬菜大豐收。 T: It' s harvest time. Is there only one way to get vegetables? Ss: Yes, 只有一種採收方式,拔下來就好/ No, 有不同的收成方式/ Free response. T: Please use iPad to find out what' s the best way to get your vegetables. T: What' s the best way to get vegetables? Ss: 我的小白菜(菠菜/油菜/莧菜)…可以直接連根拔起/我的空心</p>	<p>剪刀 袋子 蔬菜</p>	<p>實作評量</p> <p>口頭評量</p>

<p>菜有兩種採收方式，一種是連根拔起，另一種是剪下空心菜的上半部，留下一點莖，剩下的根和莖可以繼續生長/我的番茄要等開花結果，果實成熟後，摘果實就好/ Free response.</p> <p>T: If we want to eat vegetables' leaves, we will get them before blossom. In that case, we won' t be able to observe its whole life. So, when you get your vegetables, please save one in soil. Keep observing it to see what will happen. Let' s get your vegetables now!</p> <p>2. 認識蔬菜的一生。</p> <p>T: Let' s think about the life cycle of plants. What starts first?</p> <p>Ss: Seed/從種子開始。</p> <p>T: Plants' life start with seeds. What' s next?</p> <p>Ss: 發芽。</p> <p>T: Seeds will germinate, which means it grows out roots and stems. We call them 'seedling' . What' s next?</p> <p>Ss: 長出葉子/長高/ 長大。</p> <p>T: In this process, we call it 'seedling' . It starts to grow leaves, grow taller and bigger. What' s next?</p> <p>Ss: 開花。</p> <p>T: We call this an 'adult plant' , which means the plants have flowers. What' s next step?</p> <p>Ss: Fruit.</p> <p>T: Great. Do plants die when it has fruit?</p> <p>Ss: No, 果實裡面有種子，然後就又可以長出新的植物/ Free response.</p> <p>T: That' s why we call it 'plant life cycle' . Sometimes plants will die, but we still can get the seeds to plant them again. Let' s watch the video about plant life cycle.</p> <p>綜合活動：(10')</p> <p>1. 總結:植物生命週期順序。</p> <p>T: Let' s make the conclusion. The life cycle of a plant has 5 parts. That will be...</p> <p>Ss & T: Seed, germination, seedling, adult plants (flowers), and fruit.</p> <p>T: And life cycle goes on and on- seed, germination, seedling, adult plants (flowers), fruit.</p>	<p>影片</p> <p>習作 p.12-17</p>	<p>口頭評量</p>
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2. 完成習作。		
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T: Finish the workbook.