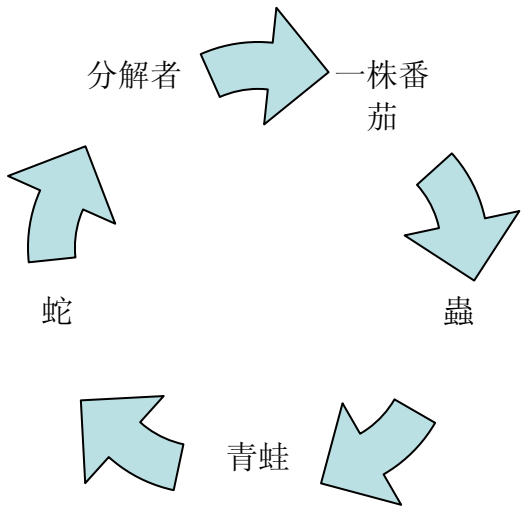
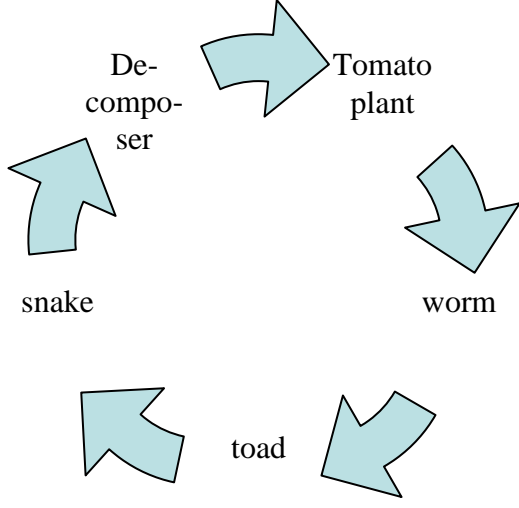


單元五：自然環境中的動物與植物	Unit 5: Animals and Plants in Their Environment
<p>主要觀念：</p> <p>5.1: 在生態環境中依據它們的作用把生物分類為生產者，消耗者，分解者（食物鏈及食物網）</p> <p>5.2: 探究植物如何用陽光的能源及空氣，水來製造食物環境以求生存</p> <p>5.3:了解食物供給生長及復原所需的能量及物質。</p> <p>5.4: 說明在一個聚落裏的群體為著資源而互相競爭</p> <p>5.5: 認識到在一個物種裏的個別差異可能使某一些動物或植物在存活或繁衍後代上佔優勢。</p> <p>5.6: 描述生物的健康，生長，及發展受到如食物，水，空氣，空間，陽光等等環境的影響。</p> <p>5.7: 動物的感覺幫助牠們存活</p> <p>5.8: 觀察到環境改變的時候，有些動植物能存活並繁衍後代，有一些死亡或遷移到別處。</p> <p>5.9: 描述人類 *依賴自然及人造的環境</p>	<p>Key Ideas:</p> <p>5.1: Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web)</p> <p>5.2: Explore how plants manufacture food by utilizing air, water, and energy from the sun</p> <p>5.3: Understand that food supplies energy and materials necessary for growth and repair</p> <p>5.4: Identify populations within a community that are in competition with one another for resources</p> <p>5.5: Recognize that individual variations within a species may cause certain individuals to have an advantage in surviving and reproducing</p> <p>5.6: Describe how the health, growth, and development of organisms are affected by environmental conditions such as availability of food, water, air, space, shelter, heat, and sunlight.</p> <p>5.7: Understand that their senses help animals survive</p> <p>5.8: Observe that when the environment changes, some plants and animals survive and reproduce, while others die or move to new locations</p> <p>5.9: Describe the way that humans: * Depend on their natural and constructed</p>

<p>*已經把環境改變了</p> <p>5.10: 舉例說明人類的行為對生物的正面及負面的影響。(如, 清除森林)。</p>	<p>environment</p> <p>* Have changed their environment over time</p> <p>5.10: Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation)</p>
<p>單元大綱</p>	<p>Unit Overview</p>
<p>動物需要住在能夠滿足牠們需要的地方。動物與植物互相依賴才能生存。一個食物鏈就是食物的能量在一連串的生物中的轉移。每一個食物鏈都從生產者開始。生產者就是能夠自己製造食物的生物。有一些消耗者會去吃這些生產者。被吃的消耗者叫做被捕食者, 去吃的叫做捕食者。</p> <p>食物鏈可以重疊。幾個重疊在一起的食物鏈叫做食物網。</p> <p>植物與動物是一個生態環境裏的生物的部分, 它們影響這個生態環境。陽光, 空氣, 水和土壤是生態環境裏的非生物的部分, 它們也影響到生態環境。</p> <p>人類用不同的方式使用生態環境裏的資源, 他們對生態環境有正面及負面的影響。污染及清除森林都是負面的影響。種植新樹以及再造溼地卻是正面的影響。</p>	<p>Animals must live in places that meet their needs. Living things depend on one another to live. A food chain is the movement of food energy in a sequence of living things. Every food chain starts with producers. Any living thing that can make its own food is called a producer. Some consumers eat these producers. Consumers that are eaten are called prey. A consumer that eats prey is a predator.</p> <p>Food chains can overlap. Several food chains that overlap form a food web.</p> <p>Plants and animals are the living parts of an ecosystem. They affect ecosystems. Sunlight, air, water, and soil are the nonliving parts of an ecosystem. They affect the ecosystems as well.</p> <p>Humans use the resources in ecosystems. They use them in many ways. Humans also make many negative and positive changes in ecosystems. Negative changes are pollution and deforestation. Sometimes humans make positive changes when they plant new trees and create new wetlands.</p>

單元五：自然環境中的動物與植物	Unit 5: Animals and Plants in Their Environment
關鍵問題：在自然環境中的動物與植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要觀念 5.1：在生態環境中依據它們的作用把生物分類為生產者，消耗者，分解者（食物鏈及食物網）	Key Idea 5.1: Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web).
科學名詞：1. 生態環境 2. 群體 3. 生產者 4. 消耗者 5. 分解者	Scientific Terms: 1. ecosystem 2. population 3. producer 4. consumer 5. decomposer
<p>內容：</p> <p>我們都住在一個環境裏。環境就是包圍著你的所有生物及非生物。在一個地區裏所有的生物及非生物形成一個生態環境。</p> <p>生態環境可以很小，可能是石頭底下的一個空間。這個石頭底下的小小的生態環境也有非生物存在。這些非生物包括了空氣跟泥土，也有幾滴水。所有的生態環境都要有一些水。生態環境也可以像森林一樣大。森林裏也有生物及非生物。森林裏有上百種的植物與動物，也有水，空氣，泥土，及氣候。</p> <p>一棵植物或一隻動物都是一個個體。你也是一個個體。一群同樣的個體住在同一個生態環境裏就是一個群體。生態環境通常以住在當地的主要群體來命名。</p> <p>大部分生物所用的精力來自太陽。植物用空氣，水，以及陽光製造食物。植物的根從土裏帶來礦物質及水幫助植物製造食物。雖然其他的生物不能用陽光來製造食物，它們卻享用植物所製造的食物。綠色植物叫做生產者。它們之所以叫生產者是因為它們製造食物給自己及所有的動物。</p>	<p>Content:</p> <p>We all live in an environment. An environment is all the living and nonliving things that surround you. All the living and nonliving things in an area form an ecosystem.</p> <p>An ecosystem can be very small. It might be the space under a rock. The small ecosystem found under a rock has nonliving parts, too. They include pockets of air and the soil under the rock. You might find a few drops of water as well. All ecosystems must have at least a little water. An ecosystem can also be as large as a forest. A forest has living and nonliving things. It includes hundreds of kinds of plants and animals. It also includes water, air, soil, and climate.</p> <p>One plant or animal is an individual. You are an individual. A group made up of the same kind of individuals living in the same ecosystem is a population. Ecosystems are often named for the main population that lives there.</p> <p>Most of the energy living things use comes from the sun. Plants make their own food using air, water, and light energy from the sun. Roots bring in minerals and water from the soil to help the plant make food. Although other living things cannot make food from the sun's energy, they use the</p>

<p>一隻動物去吃植物或其他的動物叫做消耗者。消耗者不能自己製造食物所以牠們必須吃其他的生物。</p> <p>生態環境：是一個生物與非生物互動的地方。</p> <p>有機體：是一個生物，一棵植物或一隻動物。</p> <p>分解者是一個生物，以吃死掉的植物及動物的遺體或排泄維生。分解者把生物的遺體分解。有些分解者很小，你只能用顯微鏡才看得到。有些分解者很大，像蘑菇及蚯蚓。分解者很重要。若沒有它們，死掉的生物就會堆積起來，它們體內的能量及養分就因此浪費掉了。分解者在分解死掉的生物遺體時，這些遺體就把能量及養分給回土壤裏讓植物去享用。</p> <p>生物互相依賴而存活。食物鏈就是一連串的生物的食物能量轉移。食物鏈從生產者開始，例如一棵番茄從陽光取得的能量來製造食物。然後，一隻蟲來吃番茄的葉子，從儲存在葉子裏的食物中取得能量。一隻青蛙來吃這隻蟲子因此取得在蟲子體內的食物。然後這隻青蛙可能成爲一隻飢餓的蛇的大餐。</p> <p>分解者是食物鏈的最後一環。</p>	<p>food made by plants. Green plants are called producers. Plants are called producers because they produce the basic food supply for themselves and for all animals.</p> <p>An animal that eats plants or other animals is called a consumer. Consumers cannot make their own food, so they must eat other living things.</p> <p>Ecosystem: a place where both living and nonliving things interact with each other.</p> <p>Organism: a living thing, such as a plant or animal.</p> <p>A decomposer is a living thing that feeds on wastes and on the remains of dead plants and animals. Decomposers break down the dead bodies of other organisms. Some decomposers are tiny bacteria that you can see only with a microscope. Other decomposers are as big as mushrooms and earthworms. Decomposers play important roles. Without them, dead organisms would pile up. Their stored energy and nutrients would be wasted. When decomposers break down the bodies of dead organisms, they return energy and nutrients to the soil for plants to use.</p> <p>Living things depend on one another to live. A food chain is the movement of food energy in a sequence of living things. A food chain begins with a producer, such as a tomato plant that makes food from the sun's energy. Next, a tomato worm might eat the tomato leaf and get energy from the food stored in the leaf. A toad might eat the food stored in the tomato worm's body. Then the toad might become a meal for a hungry snake.</p> <p>Decomposers are the last step in a food chain.</p>
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<p>食物鏈</p>  <p>食物鏈顯示出一隻動物如何從一種食物來源取得能量。但是食物鏈也可以重疊。一種生產者可能是不同的消耗者的食物。一些消耗者可能吃不同的食物。幾個食物鏈重疊起來形成了一個食物網。在一個食物網裏，低級的消耗者在最底下，中級的消耗者在牠們上一層，高級的消耗者在最上層。</p>	<p>Food Chain:</p>  <p>A food chain shows how an animal gets energy from one food source. But food chains can overlap. One kind of producer may be food for different kinds of consumers. Some consumers may eat different kinds of food. Several food chains that overlap form a food web. In a food web, the first-level consumers are at the bottom, the second-level consumers go on top of them, and the top-level consumers are at the top.</p>
<p>複習:</p> <ol style="list-style-type: none"> 1. 為什麼植物是生產者? 2. 什麼是生產者? 什麼是消耗者? 各給兩個例子。 3. 分解者如何循環使用能量? 4. 什麼是食物鏈? 	<p>Review:</p> <ol style="list-style-type: none"> 1. Why are plants called producers? 2. What is a producer? What is a consumer? Give two examples of each. 3. How do decomposers recycle energy? 4. What is a food chain?

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關鍵問題：在自然環境中的動物與植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要觀念 5.2：探究植物如何用陽光的能源及空氣，水來製造食物	Key Idea 5.2: Explore how plants manufacture food by utilizing air, water, and energy from the sun
科學名詞：1. 管狀 2. 葉綠粒 3. 葉綠素 4. 光合作用 5. 澱粉 6. 蘚苔類植物 7. 細胞	Scientific Terms: 1. vascular 2. chloroplasts 3. chlorophyll 4. photosynthesis 5. starch 6. bryophytes 7. cell
<p>內容：</p> <p>植物可以分成兩大類，其中一類是管狀植物。管狀植物的管把水與食物運送到植物的每一部分。管狀植物由三部分組成 – 根，莖，與葉。</p> <p>葉子就像一個工廠。它們製造食物並排出氧氣。植物細胞裏的葉綠體包含著葉綠素。葉綠素是一種綠色的物質，可以吸收陽光。葉綠體用二氧化碳，水，與光能製造糖分。這個糖分就是植物的食物。這個過程就叫做光合作用。在這個過程中，植物從空氣中吸取二氧化碳，排出氧氣。在葉子裏所製造的食物被運送到植物的每一部分，有一些食物成爲澱粉被儲存在根裏。</p> <p>第二類是非管狀植物。非管狀就是沒有管子。這類植物叫做蘚苔類植物。蘚苔類植物沒有管子運送水及食物到植物的各部分，它們直接吸收水分，好像海綿一樣。它們長得很小，很靠近地面，可以很容易從週圍吸收水及養分。它們也沒有真正的根，它們有的是很像根的部分把它們插在地裏。它們像葉子的部分會製造食物，食物就從一個細胞送到另一個細胞。蘚苔類植物包括三種：青</p>	<p>Content:</p> <p>The plant kingdom is divided into two groups. One of the two large groups of the plant kingdom is made up of vascular plants. Vascular means “having tubes.” Vascular plants have tubes that carry water and food to all their parts. Vascular plants are made up of three systems – roots, stems, and leaves.</p> <p>Leaves are like a factory. They make food and give off oxygen. The chloroplasts in plant cells contain chlorophyll. Chlorophyll is a green substance that absorbs sunlight. Chloroplasts use carbon dioxide, water, and light energy from the sun to make sugar. The sugar is food for the plant. This process is called photosynthesis. In this process, plants take carbon dioxide from the air. They give off oxygen. Food made in the leaves is carried to all parts of the plant. Some food is also stored as starch in the roots.</p> <p>The second of the two large groups of the plant kingdom is made up of nonvascular plants. Nonvascular means “without tubes.” Plants in this group are called bryophytes. Nonvascular plants do not have any tubes to carry water and food to parts of the plant. They absorb water directly, like a sponge. They are very small. They grow close to the ground, where they can absorb water and nutrients from their</p>

<p>苔，地錢，及金魚藻。青苔你可能看過，地錢與金魚藻長在陰濕的森林以及河邊。</p> <p>(細胞：你身體的每一部分都由細胞組成。每一個生物都至少有一個細胞。)</p>	<p>surroundings. They don't have real roots either. Instead, they have rootlike parts that anchor them to the ground. Their leaflike parts make food, which moves from cell to cell. The three groups of bryophytes include mosses, liverworts, and hornworts. Mosses are the bryophytes that you probably know best. Liverworts and hornworts grow in damp forests and along rivers.</p> <p>(Cell: Every part of you is made of cells. Big or small, every organism is made of at least one cell.)</p>
<p>複習：</p> <ol style="list-style-type: none">1. 管狀植物的三部分是什麼？2. 葉綠體用什麼來製造食物？3. 葉綠體製造食物的過程稱為什麼？4. 非管狀植物如何吸收水及養分？	<p>Review:</p> <ol style="list-style-type: none">1. What are the three systems that make up vascular plants?2. What do chloroplasts use to make food?3. What do we call the process of chloroplasts making food?4. How do nonvascular plants get water and nutrients?

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主要觀念 5.3：了解食物供給生長及復原所需的能量及物質。	Key Idea 5.3: Understand that food supplies energy and materials necessary for growth and repair.
科學名詞：1. 草食動物 2. 肉食動物 3. 雜食動物	Scientific Terms: 1. herbivores 2. carnivores 3. omnivores
<p>內容：</p> <p>可以自己製造食物的生物叫做生產者。青苔是一個生產者，紅杉也是一個生產者。</p> <p>吃植物及其他動物的動物叫做消耗者。消耗者藉著吃而取得生活的能量。</p> <p>有三種不同的消耗者：草食動物，肉食動物，及雜食動物。</p> <p>草食動物只吃植物，或生產者。馬，及長頸鹿，松鼠，兔子都是草食動物。馬終年都吃同樣的食物。天暖的時候吃草，冬天吃乾草。</p> <p>肉食動物只吃其他動物。肉食動物有大有小，大如鯨魚，小如青蛙。</p> <p>雜食動物吃植物與動物，就是說，吃生產者及消耗者，包括其他雜食動物。熊和土狼都是雜食動物。熊在春天吃青草，接下來可能吃鳥蛋。牠們也可能挖美味的樹根或吃小溪裏的魚。秋天來了，牠們就吃熟透的野莓。</p> <p>能量金字塔讓我們看到從一個食物鏈裏，有</p>	<p>Content:</p> <p>Any living thing that can make its own food is called a producer. A moss is a producer. A redwood tree is also a producer.</p> <p>An animal that eats plants or other animals is called a consumer. Consumers get the energy they need to live by eating.</p> <p>There are three kinds of consumers – herbivores, carnivores, and omnivores.</p> <p>An herbivore is an animal that eats only plants, or producers. Horses are herbivores. So are giraffes, squirrels, and rabbits. Horses eat the same kind of food all year. They eat grass during warm weather. During winter, they eat hay, a kind of dried grass.</p> <p>A carnivore is an animal that eats only other animals. A carnivore can be as large as a whale or as small as a frog.</p> <p>An omnivore is an animal that eats both plants and other animals. That is, omnivores eat both producers and other consumers, including other omnivores. Bears and hyenas are omnivores. Bears eat grass in spring. Later on, they might eat birds' eggs. Bears might also dig up tasty roots or eat fish from streams. In fall, bears eat ripe berries.</p> <p>An energy pyramid shows how much</p>

<p>多少能量從一個生物傳到另一個生物。</p> <p>金字塔的底層是生產者。它們把從太陽那裏得來的能量的 90%用在生長上。剩下的 10%儲存在莖和葉子及其他部分裏。</p> <p>然後消耗者吃了生產者。牠們只吃到儲存在植物裏的能量的 10%。這些消耗者用牠們從生產者那裏所得到的能量的 90%去生長，留下 10%儲存在身體裏。這 10%就傳到吃牠們的消耗者身上。這就是為什麼消耗者要吃很多生物才能存活。</p> <p>舉例來說，一只狼要吃很多小的動物，如狐狸與貓頭鷹，才能取得存活下去的能量。狐狸與貓頭鷹也要吃許多小動物才能取得存活下去的能量。小鳥，老鼠，及其他小動物必須吃許多生產者才能取得存活下去的能量。能量金字塔的最底層就包括了上千的生產者。</p>	<p>energy is passed from one living thing to another along a food chain.</p> <p>Producers form the base of the pyramid. They use about 90 percent of the energy they get from the sun to grow. They store the other 10 percent in their stems, leaves, and other parts.</p> <p>Next, consumers eat the producers. They get only the 10 percent of energy that the plants stored. These consumers use about 90 percent of the energy they get from the producers to grow and then store the other 10 percent in their bodies. That 10 percent is passed on to the consumers that eat them. That's why consumers must eat many living things in order to live.</p> <p>For example, a wolf must eat many smaller animals, such as foxes and owls, to get the energy it needs to live. The fox and the owl must eat many smaller animals to get enough energy to live. Birds, mice, and other small animals must eat many producers to get the energy they need to live. The bottom of an energy pyramid can include thousands of producers.</p>
<p>複習：</p> <ol style="list-style-type: none"> 1. 一只鹿為什麼要整天不停地吃植物？ 2. 那種動物直接從生產者取得能量？ 3. 那種動物從其他消耗者取得能量？ 4. 那種動物從生產者及消耗者取得能量？ 	<p>Review:</p> <ol style="list-style-type: none"> 1. Why must deer eat plants all day long? 2. Which animal gets its energy directly from producers? 3. Which animal gets its energy from other consumers? 4. Which animal gets its energy from both?

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關鍵問題：在自然環境中的動物與植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要觀念 5.4：說明在一個聚落裏的群體為著資源而互相競爭	Key Idea 5.4: Identify populations within a community that are in competition with one another for resources.
科學名詞：1. 群體 2. 聚落 3. 捕食者 4. 被捕食者 5. 居留地	Scientific Terms: 1. population 2. community 3. predator 4. prey 5. habitat
<p>內容：</p> <p>一株植物或一隻動物都是一個個體。你是一個個體，一株荷花也是一個個體。一群同樣的個體住在同一個生態環境裏便是一個群體。所有住在一個城市裏的人是一個人的群體，一水塘的荷花也是一個荷花的群體。一個聚落就是住在同一個地方的所有群體。</p> <p>生物需要互相依賴才能存活。一個食物鏈就是食物能量在一連串的生物中的轉移。每一個食物鏈都從生產者開始。有一些消耗者，如鹿，會吃這些生產者。然後鹿就被別的消耗者，如豹，所吃。消耗者分為捕食者與被捕食者。</p> <p>居留地是一個環境，在這個環境裏，生物可以滿足牠們的需要。在一個居留地裏，一些動物是被捕食者，一些是捕食者。捕食者會把被捕食者的數量減少。但是被捕食者的數量太少，捕食者缺少食物，數量也會減少。例如，狼爭食羚羊，使羚羊的數目減少。羚羊數目減少以後，因為狼的食物減少，狼的數目也就被迫減少。狼的數目減少以後，羚羊就會增加，因為少了狼去捕食牠們。羚羊數目增加後，狼的數目也會增加，狼就再度爭食羚羊。羚羊與植物之間也有類似的關係。由此可見，群體之間對資源的競爭是自然界平衡群體數目的方法。</p>	<p>Content:</p> <p>One plant or animal is an individual. You are an individual. One water lily is an individual. A group made up of the same kind of individuals living in the same ecosystem is a population. All the people living in one city are a population. A group of water lilies is a population. A community is all the populations that live in the same place.</p> <p>Living things depend on one another to live. A food chain is the movement of food energy in a sequence of living things. Every food chain starts with producers. Some consumers, such as deer, eat these producers. Then the deer are eaten by other consumers, such as mountain lions. Consumers that are eaten are called prey. A consumer that eats prey is a predator. Prey is what is hunted. Predators are the hunters.</p> <p>A habitat is an environment that meets the needs of a living thing. Some animals in a habitat are prey, while other animals are predators. Predators limit the number of prey animals in a habitat. After the number of prey decreases the predators will not have enough food, and their number will decrease, too. For example, wolves are predators of antelope; they are in competition for the antelope. This causes the population of antelope to decrease. With fewer antelope available for food, the wolves go hungry, and, as a result, their population decreases. Once the population</p>

	<p>of wolves decreases, it causes an increase in the antelope population. When there are more antelope, there will also be more wolves. The competition for antelope will once again take place. Antelope and the producer have a similar relationship. So the competition for resources in a habitat is a nature's way of keeping a balance among populations.</p>
<p>複習：</p> <ol style="list-style-type: none">1. 群體與聚落有何不同？2. 說出捕食者的一個作用。3. 什麼叫做居留地？	<p>Review:</p> <ol style="list-style-type: none">1. How is a population different from a community?2. Name one of the roles of a predator.3. What is a habitat?

單元五：自然環境中的動物與植物	Unit 5: Animals and Plants in Their Environment
關鍵問題：在自然環境中的動物與植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要觀念 5.5：認識到在一個物種裏的個別差異可能使某一些動物或植物在存活或繁衍後代上佔優勢。	Key Idea 5.5: Recognize that individual variations within a species may cause certain individuals to have an advantage in surviving and reproducing.
科學名詞：1. 差異（在同一種類中的個別不同的地方）	Scientific Terms: 1. variation (Differences among members of the same population.)
<p>內容：</p> <p>在同一種類中的各個不同的地方叫做個別差異。生物的個別差異可能包括顏色，形狀，或大小。個別差異可以影響到一個物種的存活。動物能夠存活便可以繁殖。這些幫助牠們存活的個別差異就傳到牠們的後代。</p> <p>舉例來說，一個島上的食物可能不夠供應所有的在島上居住的大象。小象所需的食物少於大象。經過一段時間以後，島上只剩下小象了。</p> <p>顏色也可能影響存活。假定在同一種類的昆蟲中有兩個不同的顏色，這兩個顏色是紅色及綠色。綠色的昆蟲比較可能在草地中存活，因為它們不像紅蟲那樣容易被找到。</p> <p>另一個例子是在英國的飛蛾。這種飛蛾白天在樹幹上休息。小鳥專吃這種飛蛾。在1850年以前，工廠還沒有蓋起來，多數的樹幹都是淺色的。小鳥看到深色飛蛾的機會大於淺色飛蛾，所以深色飛蛾被吃掉的比較多，淺色飛蛾存活下來並且繁殖後代。但是到了工廠把黑煙噴到空氣中，黑煙就把樹幹弄黑了。很快，深色飛蛾的數量就增加了，因為小鳥看不到它們，它們的顏色跟樹幹混在一起。小鳥吃比較多的淺色飛蛾，深色飛</p>	<p>Content:</p> <p>There are differences among members of the same population. These differences are called variations. Variations among organisms might include color, shape, or size. Variations can affect the survival of a population. Animals that survive can reproduce. The variations that helped them survive are passed on to their young.</p> <p>For example, an island had too little food for all the elephants. The small elephants needed much less food than the large elephants. They were better able to live and reproduce. After a time, there were only small elephants living on the island.</p> <p>Color can also affect survival. Suppose there are two colors of insects in a population. The two colors are green and red. The green insects are more likely to survive in a grassy place. They are not as easy to find as the red insects.</p> <p>Another example is the peppered moths in England. Peppered moths rest on tree trunks during the day. Birds feed on the peppered moths. Before factories were built in the 1850's, most tree trunks were light in color. Birds could see the dark-colored moths more easily than the light-colored moths. More of the dark moths were eaten. So more light-colored moths survived and reproduced. But when the factories put black soot into the air, the soot settled on</p>

<p>蛾就存活下來了。</p> <p>再想一想長頸鹿吧。從前長頸鹿的頸子並不那麼長，牠們就因此必須與別的吃葉子的動物競爭食物。當然每隻長頸鹿都有一些不同。頸子長的長頸鹿就可以吃到別的動物吃不到的食物，所以牠們就有比較好的存活及尋得伴侶的機會。相反地，短頸子的長頸鹿就很難生存。經過幾百萬年，長頸子的長頸鹿存活下來，把牠們的特徵傳給牠們的後代。在今天，長頸鹿是地球上最高的動物。</p>	<p>the bark of the trees. Many of the tree trunks became black. Soon, the number of dark moths increased. The birds did not see them. They blended in with the dark tree trunks. The birds ate more light-colored moths. The dark moths survived.</p> <p>Let's think about giraffes. Once upon a time, their necks were much shorter. That meant giraffes had to compete for food with many other plant-eaters. Of course, each giraffe was slightly different from the rest. Giraffes with longer necks were able to eat food that other animals couldn't reach. Those long-necked giraffes had a good chance of living and mating. In contrast, short-necked giraffes found it harder to survive. Over millions of years, more long-necked giraffes survived, passing on their traits to their offspring. Today, giraffes are the tallest animals on Earth.</p>
<p>複習：</p> <ol style="list-style-type: none"> 1. 個別差異如何影響到生物的存活？舉兩個例子。 2. 是不是所有環境的改變對某一個物種有好處？請解釋。 	<p>Review:</p> <ol style="list-style-type: none"> 1. How can variations affect the chance that a living thing will survive? Give two examples. 2. Are all changes in the environment helpful to a population? Explain.

單元五：自然環境中的動物與植物	Unit 5: Animals and Plants in Their Environment
關鍵問題：在自然環境中的動物與植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要觀念 5.6: 描述生物的健康, 生長, 及發展受到如食物, 水, 空氣, 空間, 陽光等等環境的影響。	Key Idea 5.6: Describe how the health, growth, and development of organisms are affected by environmental conditions such as availability of food, water, air, space, shelter, heat, and sunlight.
科學名詞: 1. 沼澤地	Scientific Terms: 1. swamp
<p>內容:</p> <p>所有的生物都彼此有關係。生物同時也需要非生物, 如土壤, 水, 與空氣。如果土壤, 水, 與空氣發生了變化, 生物就會受到影響。</p> <p>人類可以改變一個地區來換取自己的需要。他們這樣做的時候, 同在一個區域的其它的生物就會受到影響。從家中以及工廠所排出的廢物會流入一條河裏, 被污染的河水就不能喝, 同時這河水也殺死了植物及動物。假設這一被污染的河水流到一個池塘裏, 裏面的其它的生物會受到什麼影響? 食物鏈與食物網又會受到什麼影響?</p> <p>工廠與汽車把有害的氣體排到空氣中。農夫噴在農作物上的殺蟲劑也污染了空氣。這些殺蟲劑同時也殺死了無害的動物及昆蟲。</p> <p>空間也影響生物。 假設你有一瓶蒼蠅。你放一些食物到瓶子裏。因為有食物, 所以蒼蠅數目就增加了。但是時間一久蒼蠅的數量會怎樣呢? 瓶子裏照樣有很多食物, 但是蒼蠅的數量減少了。許多蒼蠅死了, 因為瓶子裏存積了排泄物, 蒼蠅生存的空間減少了。</p>	<p>Content:</p> <p>All living things are connected. Living things also need non-living things like soil, water, and air. If something happens to soil, water, or air, living things will be affected.</p> <p>Humans can change an area to meet their own needs. When they do this, it affects other living things in the community. Sometimes the effects are not good. Wastes from homes and factories may enter a river. The water in the polluted rivers is unfit to drink. It also kills plant and animal life. Suppose the polluted river water reaches a pond. What would happen to its community members? What would happen to the food chains and food webs?</p> <p>Factories and cars give off harmful gasses into the air. Insect poisons that farmers spray on their crops also pollute the air. Some of these poisons kill harmless animals as well as insects.</p> <p>Space affects organisms. Suppose you have a jar of flies. You put food in the jar. Because there is food, the population of flies grows. But what will happen to the population of flies after a longer time? There is still plenty of food, but the population has decreased. Many of the flies have died because of the buildup of wastes in the jar. There is not enough</p>

<p>食物減少也影響到鹿的數量。鹿的繁殖是很快的。有一段時間在弗羅里達州大沼澤地鹿非常的多。有一年沼澤地淹大水，鹿所吃的植物被水淹沒了，鹿的食物減少了，許多鹿就因此衰弱，生病，甚至死亡。鹿的數量開始減少。</p>	<p>space for the flies.</p> <p>A lack of food limited the size of a deer population. Deer populations can grow very fast. One time, the population of deer in the Florida Everglades exploded. The Everglades is a swamp. One year it flooded. The plants that the deer eat were covered by water. There was less food for the deer and many of them became weak and sick. The sick deer died and the population started to decrease.</p>
<p>複習：</p> <ol style="list-style-type: none">1. 排泄物如何危害環境？2. 污染的空氣如何危害環境？3. 空間如何影響生物？	<p>Review:</p> <ol style="list-style-type: none">1. How could wastes harm the environment?2. How would polluted air harm the environment?3. How does space affect organisms?

單元五：自然環境中的動物與植物	Unit 5: Animals and Plants in Their Environment
關鍵問題：在自然環境中的動物與植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要觀念 5.7：動物的感覺幫助牠們存活	Key Idea 5.7: Understand that their senses help animals survive.
科學名詞： 1. 夜間動物（白天睡覺夜間醒來）2. 聲波雷達系統 3. 觸角	Scientific Terms: 1. Nocturnal (sleep during the day and are awake at night) 2. echolocation 3. tentacles
內容： 動物從牠們的感覺來知道環境的變化，動物因此能夠知道危險的來臨或因此能夠尋找食物及配偶。 多數的蝙蝠都是夜間動物。牠們不需要好的視力來尋找食物，牠們能夠在夜間用聲波雷達系統來認路。牠們發出尖銳的聲音，這個聲音可以傳到很遠。當聲音碰到擋在蝙蝠路上的東西的時候就產生回音。蝙蝠聽這個回音就知道擋路的是一棵樹，一塊石頭或是另一隻動物。 光線在水底不能傳到很遠，所以許多海裏的動物不能看得很遠。海豚在暗淡的光線裏也是用聲波雷達系統來尋找食物。 有些住在地底的動物是盲的，但是牠們的觸覺發展得很好。鼯鼠有很敏感的觸角在牠的鼻子旁邊，牠就用這些觸角來尋找食物或窩邊的東西。 鯊魚有很好的嗅覺，所以可以從很遠就聞到一點點的血腥味，跟著味道就可以吃到食物。 隼鷹可以從五哩外看到牠的獵物，金鷹從兩	Content: Animals learn about environmental changes through their senses. This information can warn of danger or help find food and mates. Most species of bats are nocturnal. They do not need good eyesight to find prey. Instead, bats find their way in the dark using echolocation. They make high-pitched sounds that travel long distances through the air. When these sounds hit an object in the bat's path, they echo. The bat listens to the echo and can tell by the sound whether the object ahead is a tree, rock, or another animal. Light does not travel well underwater, so many water-dwelling animals cannot see long distances. Dolphins can hunt in dim light using echolocation. Some animals that live underground are blind, but they have a well-developed sense of touch. The star-nosed mole has sensitive feelers, called tentacles, around its nose. It uses these tentacles to find food and objects in its underground home. Sharks have developed an excellent sense of smell. This adaptation allows them to smell even the smallest amount of blood from far away. They can follow the scent right to their next meal. A peregrine falcon can spot its prey from

哩外就能看到牠的獵物。	more than 5 miles away. The golden eagle can spot its prey from over 2 miles away.
複習： 1. 蝙蝠在夜間怎樣認路？ 2. 鯊魚如何尋找食物？	Review： 1. What do bats use to find their way in the dark? 2. How do sharks find food?

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主要觀念 5.8：觀察到環境改變的時候，有些動植物能存活並繁衍後代，有一些死亡或遷移到別處。	Key Idea 5.8: Observe that when the environment changes, some plants and animals survive and reproduce, while others die or move to new locations.
科學名詞：1. 適應 2. 蒸發 3. 遷移 4. 冬眠	Scientific Terms: 1. adapt 2. evaporate 3. migrate 4. hibernate
<p>內容：</p> <p>長久以來，生物爲了適應環境會做一些改變。</p> <p>適應就是身體的一部分或是一個行爲幫助一個生物存活。</p> <p>在不同環境裏的植物有不同的葉子，花，莖，與根。它們的大小，形狀，厚度，顏色，及味道都不同。舉例來說，生長在沙漠裏的仙人掌儲存水分在葉子及樹幹上。它們的葉子是針狀的，所以水分不會輕易蒸發掉。許多的沙漠植物儲存太陽的能量，但是在炎熱的白天並不製造食物，所以它們不會流失水分。</p> <p>種子需要空間，光線，營養，及水分才可以生長。所以母株要把種子散播到離自己遠一點的地方。不同種的植物有不同的方法散播種子。需要靠風來傳送種子的植物，它們的種子很小很輕或是長得像翅膀一樣。靠近水流的植物，它們的種子或所結的果實就能浮在水面。有些植物需要動物來散播種子，它們就會結出好吃好看的果實以吸引動物。</p> <p>動物爲了適應季節的變化也發展出一些行爲。有些動物，像大雁，會遷移到較暖或較</p>	<p>Content:</p> <p>Throughout time, organisms have changed and adapted to their environment.</p> <p>An adaptation is a body part or a behavior that helps a living thing survive.</p> <p>Plants in different environments have different leaves, flowers, stems, and roots. These structures may be different in size, shape, thickness, color, and scent. For example, plants of the desert, such as cactus, store water in their leaves and trunks. They have small needle-like leaves so water doesn't easily evaporate. Many desert plants store the sun's energy but don't make food during the hot daytime so that they do not lose water.</p> <p>Seeds need space, light, nutrients, and water in order to grow. So parent plants need to spread their seeds far away from themselves. Species of plants have also adapted ways to spread their seeds. Plants that depend on wind to carry seeds have seeds that are tiny and light or have wing-like structures. Plants that live near moving water may have seeds or fruit that float. Some plants depend on animals to spread their seeds. These plants must make tasty, colorful fruit to attract animals.</p> <p>Animal species have adapted their behaviors to survive seasonal changes.</p>

<p>冷的地方。灰鯨的身體可以讓牠們一年游 16,000 到 23,000 公里。牠們夏天在北極，秋天游到水暖的地方生下幼鯨。又有一些動物如花栗鼠，土撥鼠，靠著身體內所儲存的脂肪冬眠。</p> <p>遷移就是“從夏天的家遷到冬天的家然後再回來”。</p> <p>在冬眠的時候，動物的心跳跟呼吸的速度慢到幾乎停下。</p> <p>有些動物把毛的顏色改變來適應環境。夏天的時候，雪兔的毛色跟地面一樣是棕色的。但是到了冬天，毛色就變白，跟雪的顏色一樣。毛色的改變可以躲避敵人的侵襲。</p> <p>魚類跟爬蟲類沒有毛但是有鱗。鱗片可以保護牠們免受傷害同時防止乾燥。通常鱗片的顏色及圖案幫助他們躲避敵人的侵襲。蛇的鱗片幫助牠在地面滑行以便找食物飲水及居處。</p> <p>在大自然裏，生物爲了食物，空間，光線，引水，及配偶，彼此競爭激烈。例如，一株長得很高的樹就比長在它的樹蔭下的矮樹得到更多的陽光。一隻長了最美麗的尾巴的孔雀最有機會吸引配偶並且繁殖後代。</p>	<p>Some animals may migrate to warmer or cooler climates, like geese flying north or south. Gray whales' bodies allow them to swim 16,000 to 23,000 kilometers a year. They spend the summer in the Arctic. In the fall, they swim to warmer waters. There, they give birth to their young. Other animals, such as chipmunks and woodchucks, hibernate during the winter by living on stored fat.</p> <p>Migration means “moving from a summer home to a winter home and back again.”</p> <p>During hibernation, an animal's heart and breathing rates slow almost to a stop.</p> <p>Some animals change their fur color in order to adapt. During the summer, the snowshoe hare is rusty brown. This helps it blend with the ground. In the winter, the rabbit's fur turns white, which helps it blend with the snow. The color change helps the rabbit hide from enemies.</p> <p>Instead of fur, fish and reptiles have scales. Their scales help protect them from injury and from drying out. Often, the color and pattern of their scales help them hide from enemies. A snake's scales help it slide along the ground to find food, water, and shelter.</p> <p>In nature, organisms of a species compete fiercely for food, space, light, water, and mates. For example, a tall tree gets more sun than the smaller trees that live in its shade. The peacock with the brightest tail has the best chance of attracting mates and reproducing.</p>
<p>複習：</p> <ol style="list-style-type: none"> 1. 不同種的植物有不同的方法散播種子。舉兩個例子。 2. 遷移如何幫助動物在環境中求生存？ 	<p>Review:</p> <ol style="list-style-type: none"> 1. Species of plants have adapted ways to spread their seeds. Give two examples. 2. How does migration help a species survive in the environment?

3. 列舉三項動物適應冬天的行爲。	3. Name three adaptations in behavior that some animals show during the winter.
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單元五：自然環境中的動物與植物	Unit 5: Animals and Plants in Their Environment
關鍵問題：在自然環境中的動物與植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要觀念 5.9：描述人類 *依賴自然及人造的環境 *已經把環境改變了	Key Idea 5.9: Describe the way that humans: * depend on their natural and constructed environment. * have changed their environment over time.
科學名詞：1. 製造 2. 污染	Scientific Terms: 1. manufacture 2. pollution
<p>內容：</p> <p>人類依賴自然的環境。地球供應人類所需要的能量，營養，空氣，食物，水，及熱能。</p> <p>你呼吸的時候就用到空氣。</p> <p>你乘車去學校的時候就用到燃料。燃料是從油而來的。油是從地底下所取得的自然資源。</p> <p>你一開燈就用到自然資源。大部分的電是燒煤而來的。煤也是一種從地底下所取得的自然資源。</p> <p>有一些自然資源是不能被取代的，像煤，煤氣，和油。在地底下的資源用盡以後這些資源就沒有了。</p> <p>人類用不同的方法使用自然資源。他們用木頭蓋房子做傢俱，用陶土燒磚頭，用砂子做玻璃。用鐵煉成鋼，然後用鋼做汽車及其他物品。</p> <p>人類也依賴所造的環境。因為他們能夠建造一部分的環境，也能把資源從一地搬到另一地，他們因此能夠在地球的任何環境下居</p>	<p>Content:</p> <p>Humans depend on their natural environments. Earth provides the energy, nutrients, air, food, water, and heat that humans need.</p> <p>When you breathe, you use air.</p> <p>When you ride a bus to school, you use fuel. The fuel that makes the bus run is made from oil. Oil is a natural resource that is taken from under the ground.</p> <p>When you turn on a light, you use natural resources. Most electricity is produced by burning coal. Coal is a natural resource that is also taken from under the ground.</p> <p>Some natural resources cannot be replaced. They include coal, gas, and oil. After the supplies buried underground are used, these resources will be gone.</p> <p>Humans use natural resources in many ways. People build homes and furniture from wood. They make bricks from clay, and glass from sand. They use iron to make steel, which they then use to make cars and many other things.</p> <p>Humans depend on the constructed environment also. Because they can build part of their environment and move</p>

<p>住。</p> <p>人類建造住屋，種植食物，製造貨物，從所存或轉移得來的能量造出熱能。住屋因此變成他們環境的一部分，保護他們不受惡劣天氣及野獸的攻擊。他們所製造及儲藏的食物讓他們能在沒有食物的地方也能有吃食。他們所製造的貨物能幫助他們抵禦寒冷，暴風或乾旱。他們所發展出來的交通工具能夠把食物，水，能量，及貨物帶到他們需要的地方。</p> <p>長久以來，人類改變了他們的自然環境，創造了新的環境。一望無止境的森林及草原已被綿延不絕的農場及牧場所代替。在加州的洛杉磯，你可以開一百哩路，只看到小鎮及城市，沒有其他任何東西。人們在蓋住屋，使用能源，製造貨物，使用交通工具及一切其它活動的時候，同時也製造了對空氣，土地及水源的污染。</p> <p>污染就是有害的物質，能損壞空氣，水，土地。</p>	<p>resources from place to place, humans can live in almost any natural environment on earth.</p> <p>Humans build shelters, grow food, manufacture goods, and create heat from stored or transported energy sources. The shelters become part of their environment, protecting them from harsh weather and predators. The food they produce and preserve allows them to eat in places with no foods nearby. The goods they make help them survive conditions such as cold, storms or dryness. By developing means of transportation, they can bring food, water, energy, and goods to where they need them.</p> <p>Over time, humans have changed their natural environments and created new ones. Forests and grasslands that once stretched for miles have been replaced by miles of farms and ranches. Near Los Angeles, California, you can ride for almost one hundred miles without seeing anything but towns and cities. Building shelter, using energy, manufacturing goods, using transportation, and other human activities have created pollution in the air, land, and water.</p> <p>Pollution is harmful substances that damage the air, water, land, or food supply.</p>
<p>複習：</p> <ol style="list-style-type: none"> 1. 人類為什麼可以住在惡劣的環境之下？ 2. 什麼是污染？ 	<p>Review:</p> <ol style="list-style-type: none"> 1. Why are humans able to live in harsh environments? 2. What is pollution?

單元五：自然環境中的動物與植物	Unit 5: Animals and Plants in Their Environment
關鍵問題：在自然環境中的動物與植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要觀念 5.10：舉例說明人類的行為對生物的正面及負面的影響。（如，清除森林）。	Key Idea 5.10: Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).
科學名詞：1. 化學物質 2. 循環使用	Scientific Terms: 1. chemicals 2. recycle
<p>內容：</p> <p>人類對環境有負面的影響。 當人類清除森林來蓋房子以及購物中心時，他們同時也會壞了居留地。動物因此不能在居留地找到牠們生存所必需的東西，牠們不是遷移就是死去。</p> <p>農夫犁地來種植農作物。犁地會把土壤弄鬆。這樣一來當下雨颶風的時候土壤就會被帶走。</p> <p>在田裏的化學物質被風雨沖走的時候也同時污染了水源。這些化學物質流到小溪和河流裏。家裏及商業的垃圾也會流到水源裏。</p> <p>多數的空氣污染是因為燃燒汽油。車子引擎裏的廢氣把化學物質帶到空氣裏。工廠的煙囪排出更多的化學物質。有一些化學物質造成酸雨，酸雨可以把樹及植物燒毀，也可以毒化湖泊及河流。</p> <p>土壤的污染可從肥料及垃圾而來。像舊的油漆及通水管的清潔劑都可以毒化土壤。</p> <p>從人類各種活動而來的污染使得土地，水，及空氣對所有的生物來說都不健康。</p> <p>人類有時也把環境變得更好。</p>	<p>Content:</p> <p>Humans make many negative changes in the environment. When people clear land (deforest) for houses and shopping malls, they destroy habitats. As a result, the animals that lived there can no longer meet all their basic needs. They must move or die.</p> <p>Farmers plow land to plant crops. Plowing loosens soil. That makes it easier for rain and wind to carry away the soil.</p> <p>Storms washing chemicals off fields can cause water pollution. These chemicals flow into streams and rivers. Trash and waster from homes and businesses can also enter the water supply.</p> <p>Much air pollution comes from burning gasoline. Fumes from car engines carry chemicals into the air. Factory smokestacks release more chemicals. Some of these chemicals form acid rain. Acid rain can burn trees and other plants. It can poison lakes and rivers.</p> <p>Soil pollution can come from fertilizers and trash. Wastes, such as old paint and drain cleaners, can poison the soil.</p> <p>Pollution from human activity makes the land, water, and air less healthy for all organisms.</p> <p>Humans sometimes change environments</p>

<p>人類引水灌溉乾地讓植物可以生長。</p> <p>在缺少食物的時候他們餵食野生動物。</p> <p>植物遭天災而死去的時候人們可以再種新樹來代替。</p> <p>人們開始減少污染，例如，現在的車子裝了特別的裝置在排氣管上使得有害的氣體減少排到空氣裏。</p> <p>工廠現在也減低了有害化學物質，他們不再把垃圾倒在小溪與河流裏。</p> <p>有許多人開始使用天然的方法清除野草及小蟲。他們也減少了灑在田裏及花園裏的化學物質。</p> <p>人們開始循環使用紙張，玻璃，金屬，及塑膠。循環使用比製造新的成品少用了能量，這表示燒煤減少了。減少燒煤表示減少污染。</p>	<p>in helpful ways.</p> <p>Humans have brought water to dry lands so that plants can grow.</p> <p>They sometimes feed wild animals when food is scarce.</p> <p>Some humans plant trees to replace those that have died from natural causes.</p> <p>People are also polluting less. For example, cars now have special devices on their tailpipes. These devices reduce the harmful gases that escape into the air.</p> <p>Factories now release fewer chemicals. They don't dump wastes into rivers and streams.</p> <p>Many people now use natural ways to get rid of weeds and insects. They spread fewer chemicals on fields and lawns.</p> <p>People also recycle paper, glass, metal, and plastic. Recycling uses less energy than making new products. This means less coal is burned. Burning less coal means less pollution.</p>
<p>複習：</p> <ol style="list-style-type: none"> 1. 舉例說明人類的什麼活動對生物有正面影響。 2. 舉例說明人類的什麼活動對生物有負面影響。 3. 循環使用為什麼對環境有正面影響？ 	<p>Review:</p> <ol style="list-style-type: none"> 1. Give one example where human activity has a positive effect on other organisms. 2. Give one example where human activity has a negative effect on other organisms. 3. Why does recycling have a positive effect on the environment?

答案:	Answer Key
單元五	Unit 5
<p>5.1</p> <ol style="list-style-type: none"> 1. 綠色植物叫做生產者。它們之所以叫生產者是因為它們製造食物給自己及所有的動物。 2. 生產者是一個生物，例如一株植物，能夠自己製造食物。一棵很小的青苔及一棵很大的紅衫都是生產者。消耗者也是一個生物，但是不能自己製造食物，必須吃其他的生物。一隻鹿是吃植物的消耗者，獅子吃其他動物的消耗者。 3. 分解者是一個生物，以吃死掉的植物及動物的遺體或排泄維生。分解者把生物的遺體分解。若沒有它們，死掉的生物就會堆積起來，它們體內的能量及養分就因此浪費掉了。分解者在分解死掉的生物遺體時，這些遺體就把能量及養分給回土壤裏讓植物去享用。 4. 食物鏈就是一連串的生物的食物能量轉移。食物鏈從生產者開始，例如一棵番茄從陽光取得的能量來製造食物。然後，一隻蟲來吃番茄的葉子，從儲存在葉子裏的食物中取得能量。一隻青蛙來吃這隻蟲子因此取得在蟲子體內的食物。然後這隻青蛙可能成爲一隻飢餓的蛇的大餐。 <p>5.2</p> <ol style="list-style-type: none"> 1. 管狀植物是由根，莖，與葉組成的。 2. 葉綠體用二氧化碳，水，與光能製造糖分。這個糖分就是植物的食物。 	<p>5.1</p> <ol style="list-style-type: none"> 1. Green plants are called producers because they produce the basic food supply for themselves and for all animals. 2. A producer is a living thing, such as a plant, that can make its own food. A moss (very small) and a huge redwood tree are all producers. A consumer is a living thing that cannot make its own food and must eat other living things. A deer is a consumer that eats plants; a lion is a consumer that eats other animals. 3. A decomposer is a living thing that feeds on wastes and on the remains of dead plants and animals. Decomposers break down the dead bodies of other organisms. Without them, dead organisms would pile up. Their stored energy and nutrients would be wasted. When decomposers break down the bodies of dead organisms, they return energy and nutrients to the soil for plants to use. 4. A food chain is the movement of food energy in a sequence of living things. A food chain begins with a producer, such as a tomato plant that makes food from the sun's energy. Next, a tomato worm might eat the tomato leaf and get energy from the food stored in the leaf. A toad might eat the food stored in the tomato worm's body. Then the toad might become a meal for a hungry snake. <p>5.2</p> <ol style="list-style-type: none"> 1. Vascular plants are made up of three systems – roots, stems, and leaves. 2. Chloroplasts use carbon dioxide, water, and light energy from the sun

<p>3. 這個過程就叫做光合作用。</p> <p>4. 蘚苔類植物沒有管子運送水及食物到植物的各部分，它們直接吸收水分，好像海綿一樣。它們長得很小，很靠近地面，可以很容易從週圍吸收水及養分。它們也沒有真正的根，它們有的是很像根的部分把它們插在地裏。它們像葉子的部分會製造食物，食物就從一個細胞送到另一個細胞。</p> <p>5.3</p> <p>1. 能量金字塔讓我們看到從一個食物鏈裏，有多少能量從一個生物傳到另一個生物。金字塔的底層是生產者（植物）。它們把從太陽那裏得來的能量的90%用在生長上。剩下的10%儲存在莖和葉子及其他部分裏。然後消耗者（鹿）吃了生產者（植物）。牠們只吃到儲存在植物裏的能量的10%。這些鹿用牠們從植物那裏所得到的能量的90%去生長，留下10%儲存在身體裏。這就是為什麼消耗者（鹿）要吃很多植物才能存活。</p> <p>2. 馬，長頸鹿，松鼠，及兔子。</p> <p>3. 狼及青蛙。</p> <p>4. 熊和土狼。</p> <p>5.4</p> <p>1. 一株植物或一隻動物都是一個個體。你是一個個體，一株荷花也是一個個體。一群同樣的個體住在同一個生態環境裏便是一個群體。所有住在一個城市裏的人是一個人的群體，一水塘的荷花也是一個荷花的群體。一個聚落就是住在同一個地方的所有群體。</p> <p>2. 捕食者會把被捕食者的數量減少。</p>	<p>to make sugar. The sugar is food for the plant.</p> <p>3. This process is called photosynthesis.</p> <p>4. They absorb water directly, like a sponge. They are very small. They grow close to the ground, where they can absorb water and nutrients from their surroundings. They don't have real roots either. Instead, they have rootlike parts that anchor them to the ground. Their leaflike parts make food, which moves from cell to cell.</p> <p>5.3</p> <p>1. An energy pyramid shows how much energy is passed from one living thing to another along a food chain. Producers (plants) form the base of the pyramid. They use about 90 percent of the energy they get from the sun to grow. They store the other 10 percent in their stems, leaves, and other parts. Next, consumers (deer) eat the producers (plants). They get only the 10 percent of energy that the plants stored. The deer use about 90 percent of the energy they get from the plants to grow and then store the other 10 percent in their bodies. That's why consumers (deer) must eat plants all day in order to live.</p> <p>2. Horses, giraffes, squirrels, and rabbits.</p> <p>3. Wolves and frogs.</p> <p>4. Bears and hyenas.</p> <p>5.4</p> <p>1. One plant or animal is an individual. You are an individual, one waterlily is an individual. A group made up of the same kind of individuals living in the same ecosystem is a population. All the people living in one city is a population, a group of waterlilies is a population. A community is all the</p>
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<p>3. 居留地是一個環境，在這個環境裏，生物可以滿足牠們的需要。</p> <p>5.5</p> <p>1. 一個島上的食物可能不夠供應所有的在島上居住的大象。小象所需的食物少於大象。經過一段時間以後，島上只剩下小象了。另一個例子，顏色也可能影響存活。假定在同一種類的昆蟲中有兩個不同的顏色，這兩個顏色是紅色及綠色。綠色的昆蟲比較可能在草地中存活，因為它們不像紅蟲那樣容易被找到。</p> <p>2. 一個例子是在英國的飛蛾。這種飛蛾白天在樹幹上休息。小鳥專吃這種飛蛾。在 1850 年以前，工廠還沒有蓋起來，多數的樹幹都是淺色的。小鳥看到深色飛蛾的機會大於淺色飛蛾，所以深色飛蛾被吃掉的比較多，淺色飛蛾存活下來並且繁殖後代。但是到了工廠把黑煙噴到空氣中，黑煙就把樹幹弄黑了。很快，深色飛蛾的數量就增加了，因為小鳥看不到它們，它們的顏色跟樹幹混在一起。小鳥吃比較多的淺色飛蛾，深色飛蛾就存活下來了。所以環境的改變影響到一個物種的數量。</p>	<p>populations that live in the same place.</p> <p>2. Predators limit the number of prey animals in a habitat.</p> <p>3. A habitat is an environment that meets the needs of a living thing.</p> <p>5.5</p> <p>1. An island had too little food for all the elephants. The small elephants needed much less food than the large elephants. They were better able to live and reproduce. After a time, there were only small elephants living on the island. Another example is, color can also affect survival. Suppose there are two colors of insects in a population. The two colors are green and red. The green insects are more likely to survive in a grassy place. They are not as easy to find as the red insects.</p> <p>2. One example is the peppered moths in England. Peppered moths rest on tree trunks during the day. Birds feed on the peppered moths. Before factories were built in the 1850's, most tree trunks were light in color. Birds could see the dark-colored moths more easily than the light-colored moths. More of the dark moths were eaten. So more light-colored moths survived and reproduced. But when the factories put black soot into the air, the soot settled on the bark of the trees. Many of the tree trunks became black. Soon, the number of dark moths increased. The birds did not see them. They blended in with the dark tree trunks. The birds ate more light-colored moths. The dark moths survived. Changes in environment affect the number of a population.</p>
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<p>5.6</p> <ol style="list-style-type: none">1. 從家中以及工廠所排出的廢物會流入一條河裏，被污染的河水就不能喝，同時這河水也殺死了植物及動物。當這一被污染的河水流到一個池塘裏，裏面的的其它生物會受到影響。食物鏈與食物網也會受到影響。2. 工廠與汽車把有害的氣體排到空氣中。農夫噴在農作物上的殺蟲劑也污染了空氣。這些殺蟲劑同時也殺死了無害的動物及昆蟲。3. 空間也影響生物。假設你有一瓶蒼蠅。你放一些食物到瓶子裏。因為有食物，所以蒼蠅數目就增加了。但是時間一久蒼蠅的數量會怎樣呢？瓶子裏照樣有很多食物，但是蒼蠅的數量減少了。許多蒼蠅死了，因為瓶子裏存積了排泄物，蒼蠅生存的空間減少了。	<p>5.6</p> <ol style="list-style-type: none">1. Wastes from homes and factories may enter a river. The water in the polluted rivers is unfit to drink. It also kills plant and animal life. When the polluted river water reaches a pond, it will harm its community members. It will also harm the food chains and food webs.2. Factories and cars give off harmful gases into the air. Insect poisons that farmers spray on their crops also pollute the air. Some of these poisons kill harmless animals as well as insects.3. Space affects organisms. Suppose you have a jar of flies. You put food in the jar. Because there is food, the population of flies grows. But what will happen to the population of flies after a longer time? There is still plenty of food, but the population has decreased. Many of the flies have died because of the buildup of wastes in the jar. There is not enough space for the flies.
<p>5.7</p> <ol style="list-style-type: none">1. 蝙蝠能夠在夜間用聲波雷達系統來認路。牠們發出尖銳的聲音，這個聲音可以傳到很遠。當聲音碰到擋在蝙蝠路上的東西的時候就產生回音。蝙蝠聽這個回音就知道擋路的是一棵樹，一塊石頭或是另一隻動物。2. 鯊魚有很好的嗅覺，所以可以從很遠就聞到一點點的血腥味，跟著味道就可以吃到食物。	<p>5.7</p> <ol style="list-style-type: none">1. Bats find their way in the dark using echolocation. They make high-pitched sounds that travel long distances through the air. When these sounds hit an object in the bat's path, they echo. The bat listens to the echo and can tell by the sound whether the object ahead is a tree, rock, or another animal.2. Sharks have developed an excellent sense of smell. This adaptation allows them to smell even the smallest amount of blood from far away. They can follow the scent right to their next meal.
<p>5.8</p> <ol style="list-style-type: none">1. 需要靠風來傳送種子的植物，它們的	<p>5.8</p> <ol style="list-style-type: none">1. Plants that depend on wind to carry

<p>種子很小很輕或是長得像翅膀一樣。靠近水流的植物，它們的種子或所結的果實就能浮在水面。</p> <ol style="list-style-type: none">2. 灰鯨的身體可以讓牠們一年游 16,000 到 23,000 公里。牠們夏天在北極，秋天游到水暖的地方生下幼鯨。3. 大雁會遷移到較暖或較冷的地方以適應氣候的變化。灰鯨夏天在北極，秋天游到水暖的地方生下幼鯨。花栗鼠靠著身體內所儲存的脂肪冬眠。 <p>5.9</p> <ol style="list-style-type: none">1. 因為人類能夠建造一部分的環境，也能把資源從一地搬到另一地，他們因此能夠在地球的任何環境下居住。2. 污染就是有害的物質，能損壞空氣，水，土地。 <p>5.10</p> <ol style="list-style-type: none">1. 人類有時也把環境變得更好。人類引水灌溉乾地讓植物可以生長。在缺少食物的時候他們餵食野生動物。植物遭天災而死去的時候人們可以再種新樹來代替。2. 多數的空氣污染是因為燃燒汽油。車子引擎裏的廢氣把化學物質帶到空氣裏。工廠的煙囪排出更多的化學物質。有一些化學物質造成酸雨，酸雨可以把樹及植物燒毀，也可以毒化湖泊及河流。3. 循環使用比製造新的成品少用了能量，這表示燒煤減少了。減少燒煤表示減少污染。	<p>seeds have seeds that are tiny and light or have wing-like structures. Plants that live near moving water may have seeds or fruit that float.</p> <ol style="list-style-type: none">2. Gray whales' bodies allow them to swim 16,000 to 23,000 kilometers a year. They spend the summer in the Arctic. In the fall, they swim to warmer waters. There, they give birth to their young.3. Geese flying north or south to survive seasonal changes. Gray whales swim to warmer waters to give birth to their young and then swim back to the Arctic in the summer. Chipmunks hibernate during the winter by living on stored fat. <p>5.9</p> <ol style="list-style-type: none">1. Humans can build part of their environment and move resources from place to place, so humans can live in almost any natural environment on earth.2. Pollution is harmful substances that damage the air, water, land, or food supply. <p>5.10</p> <ol style="list-style-type: none">1. Humans sometimes change environments in helpful ways. Humans have brought water to dry lands so that plants can grow. They sometimes feed wild animals when food is scarce. Some humans plant trees to replace those that have died from natural causes.2. Much air pollution comes from burning gasoline. Fumes from car engines carry chemicals into the air. Factory smokestacks release more chemicals. Some of these chemicals form acid rain. Acid rain can burn trees and other plants. It can poison lakes and rivers.3. Recycling uses less energy than
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	making new products. This means less coal is burned. Burning less coal means less pollution.
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