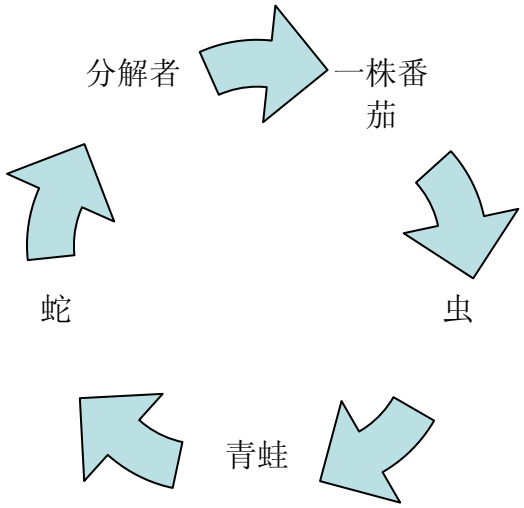
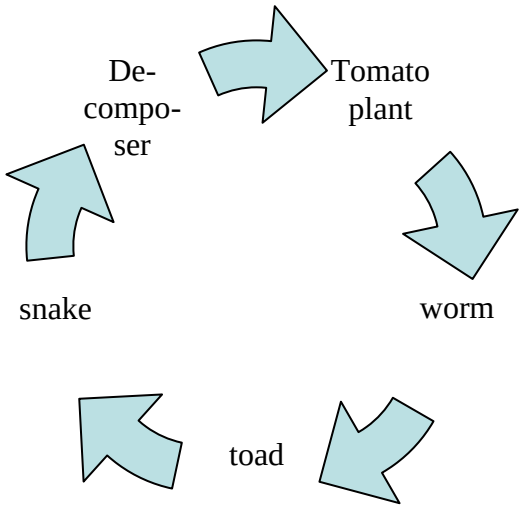
单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
主要观念:	Key Ideas:
5.1：在生态环境中依据它们的作用把生物分类为生产者，消耗者，分解者（食物链及食物网）	5.1: Classify populations of organisms as producers, consumers, or decomposers by the role they serve in the ecosystem (food chains and food web)
5.2：探究植物如何用阳光的能源及空气，水来制造食物环境以求生存	5.2: Explore how plants manufacture food by utilizing air, water, and energy from the sun
5.3:了解食物供给生长及复原所需的能量及物质。	5.3: Understand that food supplies energy and materials necessary for growth and repair.
5.4：说明在一个聚落里的群体为著资源而互相竞争	5.4: Identify populations within a community that are in competition with one another for resources
5.5：认识到在一个物种里的个别差异可能使某一些动物或植物在存活或繁衍后代上占优势。	5.5: Recognize that individual variations within a species may cause certain individuals to have an advantage in surviving and reproducing.
5.6：描述生物的健康，生长，及发展受到如食物，水，空气，空间，阳光等等环境的影响。	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.
5.7：动物的感觉帮助它们存活	5.7: Understand that their senses help animals survive.
5.8：观察到环境改变的时候，有些动植物能存活并繁衍后代，有一些死亡或迁移到别处。	5.8: Observe that when the environment changes, some plants and animals survive and reproduce, while others die or move to new locations.
5.9：描述人类 *依赖自然及人造的环境 *已经把环境改变了	5.9: Describe the way that humans: * Depend on their natural and constructed environment * Have changed their environment over

	time.
5.10：举例说明人类的行为对生物的正面及负面的影响。（如，清除森林）。	5.10: Identify examples where human activity has had a beneficial or harmful effect on other organisms (e.g., deforestation).
单元大纲	Unit Overview
动物需要住在能够满足它们需要的地方。动物与植物互相依赖才能生存。一个食物链就是食物的能量在一连串的生物中的转移。每一个食物链都从生产者开始。生产者就是能够自己制造食物的生物。有一些消耗者会去吃这些生产者。被吃的消耗者叫做被捕食者，去吃的叫做捕食者。	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.
食物链可以重叠。几个重叠在一起的食物链叫做食物网。	Food chains can overlap. Several food chains that overlap form a food web.
植物与动物是一个生态环境里的生物的部分，它们影响这个生态环境。阳光，空气，水和土壤是生态环境里的非生物的部分，它们也影响到生态环境。	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.
人类用不同的方式使用生态环境里的资源，他们对生态环境有正面及负面的影响。污染及清除森林都是负面的影响。种植新树以及再造湿地却是正面的影响。	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 like pollution and deforestation. Sometimes humans make positive changes when they plant new trees and create new wetlands.

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.1：在生态环境中依据它们的作用把生物分类為生产者，消耗者，分解者（食物链及食物网）	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).
科学名词：1. 生态环境 2. 群体 3. 生产者 4. 消耗者 5. 分解者	Scientific Terms: 1. ecosystem 2. population 3. producer 4. consumer 5. decomposer
内容： 我们都住在一个环境里。环境就是包围着你的所有生物及非生物。在一个地区里所有的生物及非生物形成一个生态环境。 生态环境可以很小，可能是石头底下的一个空间。这个石头底下的小小的生态环境也有非生物存在。这些非生物包括了空气跟泥土，也有几滴水。所有的生态环境都要有一些水。生态环境也可以像森林一样大。森林里也有生物及非生物。森林里有上百种的植物与动物，也有水，空气，泥土，及气候。 一棵植物或一隻动物都是一个个体。你也是一个个体。一群同样的个体住在同一个生态环境里就是一个群体。生态环境通常以住在当地的主要群体来命名。 大部分生物所用的精力来自太阳。植物用空气，水，以及阳光制造食物。植物的根从土里带来矿物质及水帮助植物制造食物。虽然其他的生物不能用阳光来制造食物，它们却享用植物所制造的食物。绿色植物叫做生产者。它们之所以叫生产者是因为它们制造食物给自己及所有的动物。	Content: 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. 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. 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. 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 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.
一只动物去吃植物或其他的动物叫做消耗者。消耗者不能自己制造食物所以它们必须吃其他的生物。	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.
生态环境：是一个生物与非生物互动的地方。	Ecosystem: a place where both living and nonliving things interact with each other.
有机体：是一个生物，一棵植物或一只动物。	Organism: a living thing, such as a plant or animal.
分解者是一个生物，以吃死掉的植物及动物的遗体或排泄维生。分解者把生物的遗体分解。有些分解者很小，你只能用显微镜才看得到。有些分解者很大，像蘑菇及蚯蚓。分解者很重要。若没有它们，死掉的生物就会堆积起来，它们体内的能量及养分就因此浪费掉了。分解者在分解死掉的生物遗体时，这些遗体就把能量及养分给回土壤里让植物去享用。	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.
生物互相依赖而存活。食物链就是一连串的生物的食物能量转移。食物链从生产者开始，例如一棵番茄从阳光取得的能量来製造食物。然后，一只虫来吃番茄的叶子，从储存在叶子里的食物中取得能量。一只青蛙来吃这只虫子因此取得在虫子体内的食物。然后这只青蛙可能成为一只飢饿的蛇的大餐。	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.
分解者是食物链的最后一环。	Decomposers are the last step in a food chain.

食物链  	Food Chain: 
食物链显示出一只动物如何从一种食物来源取得能量。但是食物链也可以重叠。一种生产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。几个食物链重叠起来形成了一个食物网。在一个食物网里，低级的消耗者在最底下，中级的消耗者在它们上一层，高级的消耗者在最上层。	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.
复习： 1. 为什么植物是生产者？ 2. 什么是生产者？什么是消耗者？各给两个例子。 3. 分解者如何循环使用能量？ 4. 什么是食物链？	Review: 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?

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.2：探究植物如何用阳光的能源及空气，水来制造食物	Key Idea 5.2: Explore how plants manufacture food by utilizing air, water, and energy from the sun
科学名词：1. 管状 2. 叶绿粒 3. 叶绿素 4. 光合作用 5. 淀粉 6. 蘚苔类植物 7. 细胞	Scientific Terms: 1. vascular 2. chloroplasts 3. chlorophyll 4. photosynthesis 5. starch 6. bryophytes 7. cell
内容： 植物可以分成两大类，其中一类是管状植物。管状植物的管把水与食物运送到植物的每一部分。管状植物由三部分组成 – 根，茎，与叶。	Content: 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.
叶子就像一个工厂。它们制造食物并排出氧气。植物细胞里的叶绿体包含著叶绿素。叶绿素是一种绿色的物质，可以吸收阳光。叶绿体用二氧化碳，水，与光能制造糖分。这个糖分就是植物的食物。这个过程就叫做光合作用。在这个过程中，植物从空气中吸取二氧化碳，排出氧气。在叶子里所制造的食物被运送到植物的每一部分，有一些食物成为淀粉被储存在根里。	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.
第二类是非管状植物。非管状就是没有管子。这类植物叫做蘚苔类植物。蘚苔类植物没有管子运送水及食物到植物的各部分，它们直接吸收水分，好像海绵一样。它们长得很小，很靠近地面，可以很容易从周围吸收水及养分。它们也没有真正的根，它们有的是很像根的部分把它们插在地里。它们像叶子的部分会製造食物，食物就从一个细胞送到另一个细胞。蘚苔类植物包括三种：青	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

苔，地钱，及金鱼藻。青苔你可能看过，地钱与金鱼藻长在阴湿的森林以及河边。 （细胞：你身体的每一部分都由细胞组成。每一个生物都至少有一个细胞。）	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. (Cell: Every part of you is made of cells. Big or small, every organism is made of at least one cell.)
复习： 1. 管状植物的三部分是什么？ 2. 叶绿体用什么来制造食物？ 3. 叶绿体制造食物的过程称为什么？ 4. 非管状植物如何吸收水及养分？	Review: 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?

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.3 ：了解食物供给生长及复原所需的能量及物质。	Key Idea 5.3: Understand that food supplies energy and materials necessary for growth and repair.
科学名词：1. 草食动物 2. 肉食动物 3. 杂食动物	Scientific Terms: 1. herbivores 2. carnivores 3. omnivores
内容： 可以自己制造食物的生物叫做生产者。青苔是一个生产者，红杉也是一个生产者。 吃植物及其他动物的动物叫做消耗者。消耗者藉着吃而取得生活的能量。 有三种不同的消耗者：草食动物，肉食动物，及杂食动物。 草食动物只吃植物，或生产者。马，及长颈鹿，松鼠，兔子都是草食动物。马终年都吃同样的食物。天暖的时候吃草，冬天吃乾草。 肉食动物只吃其他动物。肉食动物有大有小，大如鲸鱼，小如青蛙。 杂食动物吃植物与动物，就是说，吃生产者及消耗者，包括其他杂食动物。熊和土狼都是杂食动物。熊在春天吃青草，接下来可能吃鸟蛋。它们也可能挖美味的树根或吃小溪里的鱼。秋天来了，它们就吃熟透的野莓。 能量金字塔让我们看到从一个食物链里，有	Content: 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. An animal that eats plants or other animals is called a consumer. Consumers get the energy they need to live by eating. There are three kinds of consumers – herbivores, carnivores, and omnivores. 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. 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. 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. An energy pyramid shows how much

多少能量从一个生物传到另一个生物。 金字塔的底层是生产者。它们把从太阳那里得来的能量的 90%用在生长上。剩下的 10%储存在茎和叶子及其他部分里。 然后消耗者吃了生产者。它们只吃到储存在植物里的能量的 10%。这些消耗者用它们从生产者那里所得到的能量的 90%去生长，留下 10%储存在身体里。这 10%就传到吃它们的消耗者身上。这就是為什么消耗者要吃很多生物才能存活。 举例来说，一只狼要吃很多小的动物，如狐狸与猫头鹰，才能取得存活下去的能量。狐狸与猫头鹰也要吃许多小动物才能取得存活下去的能量。小鸟，老鼠，及其他小动物必须吃许多生产者才能取得存活下去的能量。能量金字塔的最底层就包括了上千的生产者。	energy is passed from one living thing to another along a food chain. 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. 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. 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.
复习： 1. 一只鹿为什么要整天不停地吃植物？ 2. 哪种动物直接从生产者取得能量？ 3. 哪种动物从其他消耗者取得能量？ 4. 哪种动物从生产者及消耗者取得能量？	Review: 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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关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.4：说明在一个聚落里的群体为著资源而互相竞争	Key Idea 5.4: Identify populations within a community that are in competition with one another for resources.
科学名词：1. 群体 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
内容： 一株植物或一隻动物都是一个个体。你是一个个体，一株荷花也是一个个体。一群同样的个体住在同一个生态环境里便是一个群体。所有住在一个城市里的人是一个人的群体，一水塘的荷花也是一个荷花的群体。一个聚落就是住在同一个地方的所有群体。 生物需要互相依赖才能存活。一个食物链就是食物能量在一连串的生物中的转移。每一个食物链都从生产者开始。有一些消耗者，如鹿，会吃这些生产者。然后鹿就被别的消耗者，如豹，所吃。消耗者分为捕食者与被捕食者。 居留地是一个环境，在这个环境里，生物可以满足牠们的需要。在一个居留地里，一些动物是被捕食者，一些是捕食者。捕食者会把被捕食者的数量减少。但是被捕食者的数量太少，捕食者缺少食物，数量也会减少。例如，狼争食羚羊，使羚羊的数目减少。羚羊数目减少以后，因为狼的食物减少，狼的数目也就被迫减少。狼的数目减少以后，羚羊就会增加，因为少了狼去捕食牠们。羚羊数目增加后，狼的数目也会增加，狼就再度争食羚羊。羚羊与植物之间也有类似的关系。由此可见，群体之间对资源的竞争是自然界平衡群体数目的方法。	Content: 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. 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. 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

	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.
复习： 1. 群体与聚落有何不同？ 2. 说出捕食者的一个作用。 3. 什麼叫做居留地？	Review: 1. How is a population different from a community? 2. Name one of the roles of a predator. 3. What is a habitat?

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什麼角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.5：认识到在一个物种里的个别差异可能使某一些动物或植物在存活或繁衍后代上占优势。	Key Idea 5.5: Recognize that individual variations within a species may cause certain individuals to have an advantage in surviving and reproducing.
科学名词：1. 差异（在同一种类中的个别不同的地方）	Scientific Terms: 1. variation (Differences among members of the same population.)
内容： 在同一种类中的各个不同的地方叫做个别差异。生物的个别差异可能包括颜色，形状，或大小。个别差异可以影响到一个物种的存活。动物能够存活便可以繁殖。这些帮助牠们存活的个别差异就传到它们的后代。 举例来说，一个岛上的食物可能不够供应所有的在岛上居住的大象。小象所需的食物少於大象。经过一段时间以后，岛上只剩下小象了。 颜色也可能影响存活。假定在同一种类的昆虫中有两个不同的颜色，这两个颜色是红色及绿色。绿色的昆虫比较可能在草地中存活，因为它们不像红虫那样容易被找到。 另一个例子是在英国的飞蛾。这种飞蛾白天在树干上休息。小鸟专吃这种飞蛾。在 1850 年以前，工厂还没有盖起来，多数的树干都是浅色的。小鸟看到深色飞蛾的机会大於浅色飞蛾，所以深色飞蛾被吃掉的比较多，浅色飞蛾存活下来并且繁殖后代。但是到了工厂把黑烟喷到空气中，黑烟就把树干弄黑了。很快，深色飞蛾的数量就增加了，因为小鸟看不到它们，它们的颜色跟树干混	Content: 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. 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. 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. 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

在一起。小鸟吃比较多的浅色飞蛾，深色飞蛾就存活下来了。	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.
再想一想长颈鹿吧。从前长颈鹿的颈子并不那么长，它们就因此必须与别的吃叶子的动物竞争食物。当然每隻长颈鹿都有一些不同。颈子长的长颈鹿就可以吃到别的动物吃不到的食物，所以它们就有比较好的存活及寻得伴侣的机会。相反地，短颈子的长颈鹿就很难生存。经过几百万年，长颈子的长颈鹿存活下来，把它们的特征传给它们的后代。在今天，长颈鹿是地球上最高的动物。	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.
复习： 1．个别差异如何影响到生物的存活？举两个例子。 2．是不是所有环境的改变对某一个物种有好处？ 请解释。	Review: 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.

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.6：描述生物的健康，生长，及发展受到如食物，水，空气，空间，阳光等等环境的影响。	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.
科学名词：1. 沼泽地	Scientific Terms: 1. swamp
内容： 所有的生物都彼此有关系。生物同时也需要非生物，如土壤，水，与空气。如果土壤，水，与空气发生了变化，生物就会受到影响。 人类可以改变一个地区来换取自己的需要。他们这样做的时候，同在一个区域的其它的生物就会受到影响。从家中以及工厂所排出的废物会流入一条河里，被污染的河水就不能喝，同时这河水也杀死了植物及动物。假设这一被污染的河水流到一个池塘里，里面的的其它生物会受到什么影响？食物链与食物网又会受到什么影响？ 工厂与汽车把有害的气体排到空气中。农夫喷在农作物上的杀虫剂也污染了空气。这些杀虫剂同时也杀死了无害的动物及昆虫。 空间也影响生物。 假设你有一瓶苍蝇。你放一些食物到瓶子里。因为有食物，所以苍蝇数目就增加了。但是时间一久苍蝇的数量会怎样呢？瓶子里照样有很多食物，但是苍蝇的数量减少了。许多苍蝇死了，因为瓶子里存积了排泄物，苍蝇生存的空间减少了。	Content: 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. 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? 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. 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.

食物减少也影响到鹿的数量。鹿的繁殖是很快的。有一段时间在弗罗里达州大沼泽地鹿非常的多。有一年沼泽地淹大水，鹿所吃的植物被水淹没了，鹿的食物减少了，许多鹿就因此衰弱，生病，甚至死亡。鹿的数量开始减少。	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.
复习： 1. 排泄物如何危害环境？ 2. 污染的空气如何危害环境？ 3. 空间如何影响生物？	Review: 1. How could wastes harm the environment? 2. How would polluted air harm the environment? 3. How does space affect organisms?

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.7：动物的感觉帮助它们存活	Key Idea 5.7: Understand that their senses help animals survive.
科学名词：1. 夜间动物（白天睡觉夜间醒来）2. 声波雷达系统 3. 触角	Scientific Terms: 1. Nocturnal (sleep during the day and are awake at night) 2. echolocation 3. tentacles
内容： 动物从牠们的感觉来知道环境的变化，动物因此能够知道危险的来临或因此能够寻找食物及配偶。 多数的蝙蝠都是夜间动物。它们不需要好的视力来寻找食物，它们能够在夜间用声波雷达系统来认路。它们发出尖锐的声音，这个声音可以传到很远。当声音蹤到挡在蝙蝠路上的东西的时候就產生回音。蝙蝠聽这个回音就知道挡路的是一棵树，一块石头或是另一隻动物。 光线在水底不能传到很远，所以许多海里的动物不能看得很远。海豚在暗淡的光线里也是用声波雷达系统来寻找食物。 有些住在地底的动物是盲的，但是它们的触觉发展得很好。鼴鼠有很敏感的触角在它的鼻子旁边，它就用这些触角来寻找食物或窝边的东西。 鯊鱼有很好的嗅觉，所以可以从很远就闻到一点点的血腥味，跟著味道就可以吃到食物。 隼鷹可以从五哩外看到它的猎物，金鷹从兩	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 it 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

哩外就能看到它的猎物。	more than 5 miles away. The golden eagle can spot its prey from over 2 miles away.
复习： 1. 蝙蝠在夜间怎样认路？ 2. 鲨鱼如何寻找食物？	Review: 1. What do bats use to find their way in the dark? 2. How do sharks find food?

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.8：观察到环境改变的时候，有些动植物能存活并繁衍后代，有一些死亡或迁移到别处。	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.
科学名词：1. 适应 2. 蒸发 3. 迁移 4. 冬眠	Scientific Terms: 1. adapt 2. evaporate 3. migrate 4. hibernate
内容： 长久以来，生物为了适应环境会做一些改变。 适应就是身体的一部分或是一个行为帮助一个生物存活。 在不同环境里的植物有不同的叶子，花，茎，与根。它们的大小，形状，厚度，颜色，及味道都不同。举例来说，生长在沙漠里的仙人掌储存水分在叶子及树干上。它们的叶子是针状的，所以水分不会轻易蒸发掉。许多的沙漠植物储存太阳的能量，但是在炎热的白天并不制造食物，所以它们不会流失水分。 种子需要空间，光线，营养，及水分才可以生长。所以母株要把种子散播到离自己远一点的地方。不同种的植物有不同的方法散播种子。需要靠风来传送种子的植物，它们的种子很小很轻或是长得像翅膀一样。靠近水流的植物，它们的种子或所结的果实就能浮在水面。有些植物需要动物来散播种子，它们就会结出好吃好看的果实以吸引动物。 动物为了适应季节的变化也发展出一些行	Content: Throughout time, organisms have changed and adapted to their environment. An adaptation is a body part or a behavior that helps a living thing survive. 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. 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. Animal species have adapted their behaviors to survive seasonal changes.

为。有些动物，像大雁，会迁移到较暖或较冷的地方。灰鲸的身体可以让它们一年游16,000 到 23,000 公里。它们夏天在北极，秋天游到水暖的地方生下幼鲸。 又有一些动物如花栗鼠，土拨鼠，靠著身体内所储存的脂肪冬眠。	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.
迁移就是“从夏天的家迁到冬天的家然后再回来”。	Migration means “moving from a summer home to a winter home and back again.”
在冬眠的时候，动物的心跳跟呼吸的速度慢到几乎停下。	During hibernation, an animal's heart and breathing rates slow almost to a stop.
有些动物把毛的颜色改变来适应环境。夏天的时候，雪兔的毛色跟地面一样是棕色的。但是到了冬天，毛色就变白，跟雪的颜色一样。毛色的改变可以躲避敌人的侵袭。	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.
鱼类跟爬虫类没有毛但是有鳞。鳞片可以保护它们免受伤害同时防止乾燥。通常鳞片的颜色及图案帮助他们躲避敌人的侵袭。蛇的鳞片帮助牠在地面滑行以便找食物饮水及居处。	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.
在大自然里，生物为了食物，空间，光线，引水，及配偶，彼此竞争激烈。例如，一株长得很高的树就比长在它的树荫下的矮树得到更多的阳光。一隻长了最美丽的尾巴的孔雀最有机会吸引配偶并且繁殖后代。	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.
复习： 1．不同种的植物有不同的方法散播种子。举两个例子。 2．迁移如何帮助动物在环境中求生存？	Review: 1. Species of plants have adapted ways to spread their seeds. Give two examples. 2. How does migration help a species

3．列举三项动物适应冬天的行为。	survive in the environment? 3. Name three adaptations in behavior that some animals show during the winter.

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.9：描述人类 *依赖自然及人造的环境 *已经把环境改变了	Key Idea 5.9: Describe the way that humans: * depend on their natural and constructed environment. * have changed their environment over time.
科学名词：1. 制造 2. 污染	Scientific Terms: 1. manufacture 2. pollution
内容： 人类依赖自然的环境。地球供应人类所需要的能量，营养，空气，食物，水，及热能。 你呼吸的时候就用到空气。 你乘车去学校的时候就用到燃料。燃料是从油而来的。油是从地底下所取得的自然资源。 你一开灯就用到自然资源。大部分的电是烧煤而来的。煤也是一种从地底下所取得的自然资源。 有一些自然资源是不能被取代的，像煤，煤气，和油。在地底下的资源用尽以后这些资源就没有了。 人类用不同的方法使用自然资源。他们用木头盖房子做家俱，用陶土烧砖头，用砂子做玻璃。用铁炼成钢，然后用钢做汽车及其他物品。 人类也依赖所造的环境。因为他们能够建造一部分的环境，也能把资源从一地搬到另一地，他们因此能够在地球的任何环境下居	Content: Humans depend on their natural environments. Earth provides the energy, nutrients, air, food, water, and heat that humans need. When you breathe, you use air. 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. 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. Some natural resources cannot be replaced. They include coal, gas, and oil. After the supplies buried underground are used, these resources will be gone. 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. Humans depend on the constructed environment also. Because they can build part of their environment and move resources from place to place, humans can

住。 人类建造住屋，种植食物，製造货物，从所存或转移得来的能量造出热能。住屋因此变成他们环境的一部分，保护他们不受恶劣天气及野兽的攻击。他们所製造及储藏的食物让他们能在没有食物的地方也能有吃食。他们所制造的货物能帮助他们抵御寒冷，暴风或干旱。他们所发展出来的交通工具能够把食物，水，能量，及货物带到他们需要的地方。 长久以来，人类改变了他们的自然环境，创造了新的环境。一望无止境的森林及草原已被绵延不绝的农场及牧场所代替。在加州的洛杉矶，你可以开一百哩路，只看到小镇及城市，没有其他任何东西。人们在盖住屋，使用能源，制造货物，使用交通工具及一切其它活动的时候，同时也制造了对空气，土地及水源的污染。 污染就是有害的物质，能损坏空气，水，土地。	live in almost any natural environment on earth. 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. 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. Pollution is harmful substances that damage the air, water, land, or food supply.
复习： 1. 人类为什么可以住在恶劣的环境之下？ 2. 什么是污染？	Review: 1. Why are humans able to live in harsh environments? 2. What is pollution?

单元五：自然环境中的动物与植物	Unit 5：Animals and Plants in Their Environment
关键问题：在自然环境中的动物与植物扮演什么角色？	Essential Question: What roles do plants and animals play in their environments?
主要观念 5.10：举例说明人类的行为对生物的正面及负面的影响。（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).
科学名词：1. 化学物质 2.循环使用	Scientific Terms: 1. chemicals 2. recycle
内容： 人类对环境有负面的影响。 当人类清除森林来盖房子以及购物中心时，他们同时也会坏了居留地。动物因此不能在居留地找到它们生存所必需的东西，它们不是迁移就是死去。 农夫犁地来种植农作物。犁地会把土壤弄鬆。这样一来当下雨颳风的时候土壤就会被带走。 在田里的化学物质被风雨冲走的时候也同时污染了水源。这些化学物质流到小溪和河流里。家里及商业的垃圾也会流到水源里。 多数的空气污染是因为燃烧汽油。车子引擎里的废气把化学物质带到空气里。工厂的烟囱排出更多的化学物质。有一些化学物质造成酸雨，酸雨可以把树及植物烧毁，也可以毒化湖泊及河流。 土壤的污染可从肥料及垃圾而来。像旧的油漆及通水管的清洁剂都可以毒化土壤。 从人类各种活动而来的污染使得土地，水，及空气对所有的生物来说都不健康。 人类有时也把环境变得更好。	Content: 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. Farmers plow land to plant crops. Plowing loosens soil. That makes it easier for rain and wind to carry away the soil. 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. 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. Soil pollution can come from fertilizers and trash. Wastes, such as old paint and drain cleaners, can poison the soil. Pollution from human activity makes the land, water, and air less healthy for all organisms. Humans sometimes change environments in helpful ways.

人类引水灌溉干地让植物可以生长。 在缺少食物的时候他们喂食野生动物。 植物遭天灾而死去的时候人们可以再种新树来代替。 人们开始减少污染，例如，现在的车子装了特别的装置在排气管上使得有害的气体减少排到空气里。 工厂现在也减低了有害化学物质，他们不再把垃圾倒在小溪与河流里。 有许多人开始使用天然的方法清除野草及小虫。他们也减少了洒在田里及花园里的化学物质。 人们开始循环使用纸张，玻璃，金属，及塑胶。循环使用比製造新的成品少用了能量，这表示烧煤减少了。减少烧煤表示减少污染。	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. 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. Factories now release fewer chemicals. They don't dump wastes into rivers and streams. Many people now use natural ways to get rid of weeds and insects. They spread fewer chemicals on fields and lawns. 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.
复习： 1．举例说明人类的什么活动对生物有正面影响。 2．举例说明人类的什么活动对生物有负面影响。 3．循环使用為什么对环境有正面影响？	Review: 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
单元五 5.1 1. 绿色植物叫做生产者。它们之所以叫生产者是因为它们制造食物给自己及所有的动物。 2. 生产者是一个生物，例如一株植物，能够自己制造食物。一棵很小的青苔及一棵很大的红衫都是生产者。消耗者也是一个生物，但是不能自己制造食物，必须吃其他的生物。一只鹿是吃植物的消耗者，狮子是吃其他动物的消耗者。 3. 分解者是一个生物，以吃死掉的植物及动物的遗体或排泄维生。分解者把生物的遗体分解。若没有它们，死掉的生物就会堆积起来，它们体内的能量及养分就因此浪费掉了。分解者在分解死掉的生物遗体时，这些遗体就把能量及养分给回土壤里让植物去享用。 4. 食物链就是一连串的生物的食物能量转移。食物链从生产者开始，例如一棵番茄从阳光取得的能量来製造食物。然后，一只虫来吃番茄的叶子，从储存在叶子里的食物中取得能量。一只青蛙来吃这只虫子因此取得在虫子体内的食物。然后这只青蛙可能成为一只飢饿的蛇的大餐。 5.2 1. 管状植物是由根，茎，与叶组成的。	Unit 5 5.1 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. 5.2 1. Vascular plants are made up of three systems – roots, stems, and leaves.

2. 叶绿体用二氧化碳，水，与光能制造糖分。这个糖分就是植物的食物。
3. 这个过程就叫做光合作用。
4. 蘚苔类植物没有管子运送水及食物到植物的各部分，它们直接吸收水分，好像海绵一样。它们长得很小，很靠近地面，可以很容易从周围吸收水及养分。它们也没有真正的根，它们有的是很像根的部分把它们插在地里。它们像叶子的部分会制造食物，食物就从一个细胞送到另一个细胞。

5.3

1. 能量金字塔让我们看到从一个食物链里，有多少能量从一个生物传到另一个生物。金字塔的底层是生产者（植物）。它们把从太阳那里得来的能量的90%用在生长上。剩下的 10%储存在茎和叶子及其他部分里。然后消耗者（鹿）吃了生产者（植物）。它们只吃到储存在植物里的能量的 10%。这些鹿用它们从植物那里所得到的能量的 90%去生长，留下 10%储存在身体里。这就是為什么消耗者（鹿）要吃很多植物才能存活。
2. 马，长颈鹿，松鼠，及兔子。
3. 狼及青蛙。
4. 熊和土狼。

5.4

1. 一株植物或一只动物都是一个个体。你是一个个体，一株荷花也是一个个体。一群同样的个体住在同一个生态环境里便是一个群体。所有住在一个城市里的人是一个人的群体，一水塘的荷花也是一个荷花的群体。一个聚落就是住在同一个地方的所

2. Chloroplasts use carbon dioxide, water, and light energy from the sun to make sugar. The sugar is food for the plant.
3. This process is called photosynthesis.
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.

5.3

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.
2. Horses, giraffes, squirrels, and rabbits.
3. Wolves and frogs.
4. Bears and hyenas.

5.4

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

有群体。 2.捕食者会把被捕食者的数量减少。 3.居留地是一个环境，在这个环境里，生物可以满足它们的需要。 5.5 1. 一个岛上的食物可能不够供应所有的在岛上居住的大象。小象所需的食物少於大象。经过一段时间以后，岛上只剩下小象了。另一个例子，颜色也可能影响存活。假定在同一种类的昆虫中有两个不同的颜色，这两个颜色是红色及绿色。绿色的昆虫比较可能在草地中存活，因为它们不像红虫那样容易被找到。 2. 一个例子是在英国的飞蛾。这种飞蛾白天在树干上休息。小鸟专吃这种飞蛾。在 1850 年以前，工厂还没有盖起来，多数的树干都是浅色的。小鸟看到深色飞蛾的机会大於浅色飞蛾，所以深色飞蛾被吃掉的比较多，浅色飞蛾存活下来并且繁殖后代。但是到了工厂把黑烟喷到空气中，黑烟就把树干弄黑了。很快，深色飞蛾的数量就增加了，因为小鸟看不到它们，它们的颜色跟树干混在一起。小鸟吃比较多的浅色飞蛾，深色飞蛾就存活下来了。所以环境的改变影响到一个物种的数量。	population, a group of waterlilies is a population. A community is all the populations that live in the same place. 2. Predators limit the number of prey animals in a habitat. 3. A habitat is an environment that meets the needs of a living thing. 5.5 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. 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.

5.6

1. 从家中以及工厂所排出的废物会流入一条河里，被污染的河水就不能喝，同时这河水也杀死了植物及动物。当这一被污染的河水流到一个池塘里，里面的的其它生物会受到影响。食物链与食物网也会受到影响。
2. 工厂与汽车把有害的气体排到空气中。农夫喷在农作物上的杀虫剂也污染了空气。这些杀虫剂同时也杀死了无害的动物及昆虫。
3. 空间也影响生物。假设你有一瓶苍蝇。你放一些食物到瓶子里。因为有食物，所以苍蝇数目就增加了。但是时间一久苍蝇的数量会怎样呢？瓶子里照样有很多食物，但是苍蝇的数量减少了。许多苍蝇死了，因为瓶子里存积了排泄物，苍蝇生存的空间减少了。

5.7

1. 蝙蝠能够在夜间用声波雷达系统来认路。它们发出尖锐的声音，这个声音可以传到很远。当声音蹚到挡在蝙蝠路上的东西的时候就產生回音。蝙蝠听这个回音就知道挡路的是一棵树，一块石头或是另一隻动物。
2. 鯊鱼有很好的嗅觉，所以可以从很远就闻到一点点的血腥味，跟著味道就可以吃到食物。

5.8

1. 需要靠风来传送种子的植物，它们

5.6

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.

5.7

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.

5.8

的种子很小很轻或是长得像翅膀一样。靠近水流的植物，它们的种子或所结的果实就能浮在水面。 2. 灰鲸的身体可以让它们一年游 16,000 到 23,000 公里。它们夏天在北极，秋天游到水暖的地方生下幼鲸。 3. 大雁会迁移到较暖或较冷的地方以适应气候的变化。灰鲸夏天在北极，秋天游到水暖的地方生下幼鲸。花栗鼠靠著身体内所储存的脂肪冬眠。	1. 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. 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.
5.9 1. 因为人类能够建造一部分的环境，也能把资源从一地搬到另一地，他们因此能够在地球的任何环境下居住。 2. 污染就是有害的物质，能损坏空气，水，土地。	5.9 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.
5.10 1. 人类有时也把环境变得更好。人类引水灌溉乾地让植物可以生长。在缺少食物的时候他们喂食野生动物。植物遭天灾而死去的时候人们可以再种新树来代替。 2. 多数的空气污染是因为燃烧汽油。车子引擎里的废气把化学物质带到空气里。工厂的烟囱排出更多的化学物质。有一些化学物质造成酸雨，酸雨可以把树及植物烧毁，也可以毒化湖泊及河流。 3. 循环使用比制造新的成品少用了能量，这表示烧煤减少了。减少烧煤表示减少污染。	5.10 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 making new products. This means less coal is burned. Burning less coal means less pollution.