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生命科学

# Plant Power

# 植物的力量

KATE BOEHM NYQUIST (美) 著

外语教学与研究出版社

FOREIGN LANGUAGE TEACHING AND RESEARCH PRESS

(京)新登字 155 号

京权图字: 01 - 2003 - 3238

图书在版编目(CIP)数据

生命科学 植物的力量/(美)尼奎斯特(Nyquist, K. B.)著;鲜瑜注. —北京:外语教学与研究出版社, 2003.9

(国家地理科学探索丛书·自然科学系列)

ISBN 7 - 5600 - 3610 - 4

I. 生… II. ①尼… ②鲜… III. 英语—语言读物, 生命科学 IV. H319.4:Q

中国版本图书馆 CIP 数据核字(2003)第 065553 号

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国家地理科学探索丛书(英文注释版)由美国北极星传媒有限公司策划并授权出版。

生命科学

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KATE BOEHM NYQUIST (美) 著

鲜瑜 注

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责任编辑: 余 军

执行编辑: 周 晶

出版发行: 外语教学与研究出版社

社 址: 北京市西三环北路 19 号 (100089)

网 址: <http://www.fltrp.com>

印 刷: 北京瑞宝画中画印刷有限公司

开 本: 740×975 1/16

印 张: 2

版 次: 2003 年 11 月第 1 版 2003 年 11 月第 1 次印刷

书 号: ISBN 7 - 5600 - 3610 - 4/H·1805

定 价: 5.90 元

\* \* \*

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这套丛书以英文注释形式出版，注释由国内重点中学教学经验丰富的英语教师完成。特别值得推荐的是本套丛书在提高青少年读者英语阅读能力的同时，还注重培养他们的科学探索精神、动手能力、逻辑思维能力和沟通能力。

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# Plants to the Rescue

## 救命的植物

1. Appalachian Mountains

阿巴拉契亚山脉

2. North Carolina

北卡罗来纳州

Appalachian Mountains<sup>1</sup>,  
North Carolina<sup>2</sup>



*It was spring 1810, deep in the southern Appalachians. A Cherokee<sup>1</sup> girl held her aching<sup>2</sup> stomach and cried in pain. What could she do?*

**C**herokee tradition<sup>3</sup> provided the answer. Native Americans<sup>4</sup> knew how to use the forest as their pharmacy<sup>5</sup>. The knowledge of how to use plants to cure<sup>6</sup> illness was passed down<sup>7</sup> from generation<sup>8</sup> to generation. For stomachaches, the Cherokee made a medicine from the roots of the goldenseal<sup>9</sup> plant. The girl took her medicine and began to feel better.

Without plants, humans would not survive<sup>10</sup>. We depend on<sup>11</sup> plants for food, medicine, clothing, and even the oxygen<sup>12</sup> we breathe<sup>13</sup>. Think of the plants all around you. Tree limbs<sup>14</sup> sway<sup>15</sup> in the breeze<sup>16</sup>. Colorful flowers line paths in the park. Weeds<sup>17</sup> sprout<sup>18</sup> up in empty lots<sup>19</sup>. Plants are everywhere.

This is a book about the green world that grows silently around us. We have learned how to use plants in many ways. We are beginning to understand that there are many more possibilities. So dig into the world of plants, where dirt is good and green is golden.



**Goldenseal plant**

|                    |             |              |             |           |        |
|--------------------|-------------|--------------|-------------|-----------|--------|
| 1. Cherokee        | <i>n.</i>   | 彻罗基人(北美印第安人) | 12. oxygen  | <i>n.</i> | 氧; 氧气  |
| 2. aching          | <i>adj.</i> | 疼的           | 13. breathe | <i>v.</i> | 呼吸     |
| 3. tradition       | <i>n.</i>   | 传统           | 14. limb    | <i>n.</i> | 树枝     |
| 4. Native American |             | 印第安人         | 15. sway    | <i>v.</i> | 摇摆; 摇动 |
| 5. pharmacy        | <i>n.</i>   | 药房; 备用药品     | 16. breeze  | <i>n.</i> | 微风     |
| 6. cure            | <i>v.</i>   | 治疗; 治愈       | 17. weed    | <i>n.</i> | 杂草; 野草 |
| 7. pass down       |             | 传下去          | 18. sprout  | <i>v.</i> | 发芽     |
| 8. generation      | <i>n.</i>   | 一代           | 19. lot     | <i>n.</i> | 一块地    |
| 9. goldenseal      | <i>n.</i>   | 白毛茛          |             |           |        |
| 10. survive        | <i>v.</i>   | 活下来; 继续存在    |             |           |        |
| 11. depend on      |             | 依靠; 依赖       |             |           |        |

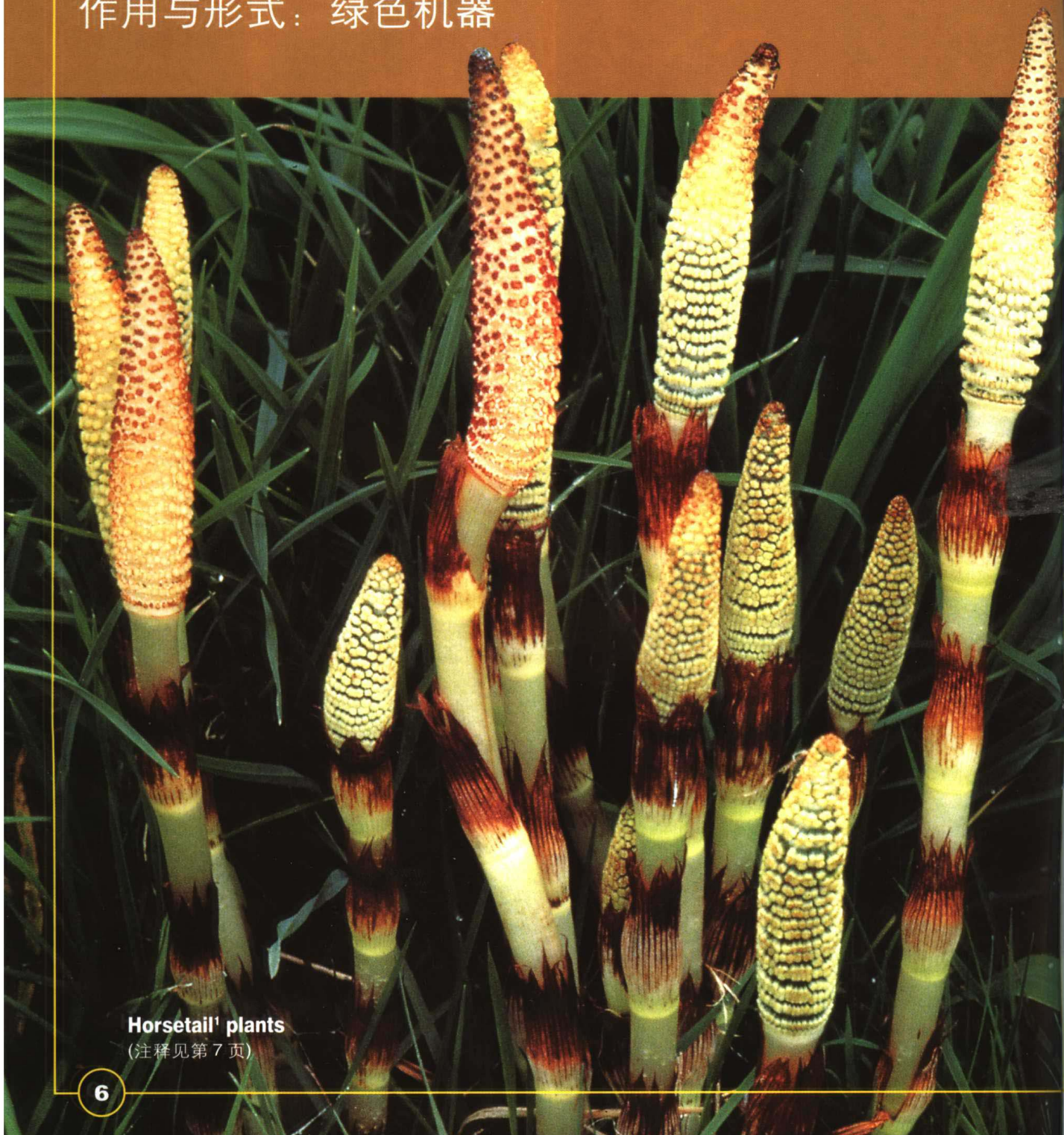


Function and Form:

# Green Machines

作用与形式：绿色机器

Horsetail' plants  
(注释见第 7 页)





*In the foothills<sup>2</sup> of the Appalachians, a settler's<sup>3</sup> family enjoyed a hearty<sup>4</sup> meal. Soon the children headed<sup>5</sup> down to a nearby stream<sup>6</sup>. But they weren't going for a swim.*

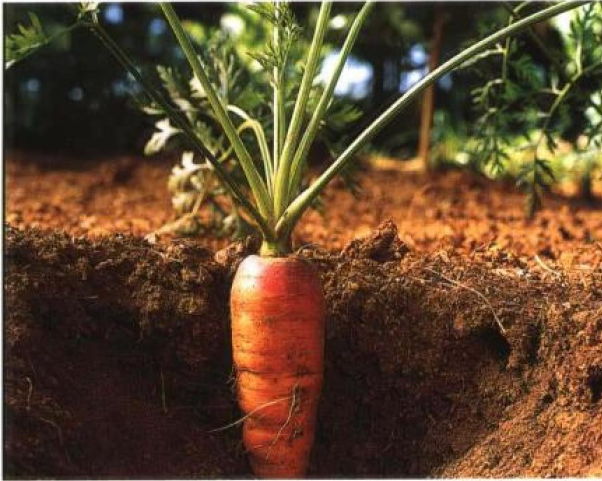
**T**hey were on their way to pick horsetail plants. Their mother needed tough<sup>7</sup> scrubbing<sup>8</sup> brushes to clean the cooking pot, and there was a good supply<sup>9</sup> at the edge<sup>10</sup> of the stream. Horsetails, which are among the most ancient<sup>11</sup> plants, probably were used as cleaning brushes by many people. These plants have been around for millions of years. Giant horsetails once stood in vast<sup>12</sup> forests that covered much of Earth's land surface<sup>13</sup>.

From the tough brush of a horsetail to the soft petals<sup>14</sup> of a rose, plants come in many different shapes and sizes. Plants grow almost everywhere—from low country rivers to high mountain slopes<sup>15</sup>. Even though they can be very different, plants all require<sup>16</sup> light, water, nutrients<sup>17</sup>, and carbon dioxide<sup>18</sup>. They share many of the same parts that help them meet these needs.

|                    |      |           |
|--------------------|------|-----------|
| 1. horsetail       | n.   | 木贼        |
| 2. foothill        | n.   | 山麓        |
| 3. settler         | n.   | 移居者       |
| 4. hearty          | adj. | 丰盛的       |
| 5. head            | v.   | (向特定方向)出发 |
| 6. stream          | n.   | 溪流        |
| 7. tough           | adj. | 坚硬的       |
| 8. scrub           | v.   | 擦洗        |
| 9. supply          | n.   | 供给        |
| 10. edge           | n.   | 边沿, 边缘    |
| 11. ancient        | adj. | 古老的       |
| 12. vast           | adj. | 辽阔的, 广阔的  |
| 13. surface        | n.   | 表面        |
| 14. petal          | n.   | 花瓣        |
| 15. slope          | n.   | 斜坡        |
| 16. require        | v.   | 需要        |
| 17. nutrient       | n.   | 营养物       |
| 18. carbon dioxide |      | 二氧化碳      |
| 19. antique        | adj. | 古时的, 古式的  |



Antique<sup>19</sup> iron pot



The orange part of a carrot is a taproot.

## Roots Anchor<sup>1</sup> and Absorb<sup>2</sup>

What parts of a plant do you like to eat? If you like to chomp<sup>3</sup> on a carrot or gobble<sup>4</sup> down forkfuls<sup>5</sup> of sweet potatoes, then you're a root-eating kid<sup>6</sup>. Roots are important structures<sup>7</sup> that do many things for a plant.

There are two main types of root systems<sup>8</sup>. A taproot<sup>9</sup> system has one main root that is thicker than the others. This taproot grows straight down into the soil. A carrot is a good example of a plant that has a taproot. The other type of system is a fibrous<sup>10</sup> root system. Plants with this kind of root system, such as grasses, have several roots of about the same size. These roots spread out<sup>11</sup> in many directions.

No matter what kind of roots a plant has, every root does certain things. Roots anchor a plant in place. When the wind blows hard and a plant bends and sways, but doesn't fall over, you know the roots are doing their job. Roots also can store food for a plant. When you eat a carrot, you are eating the plant's stored food.

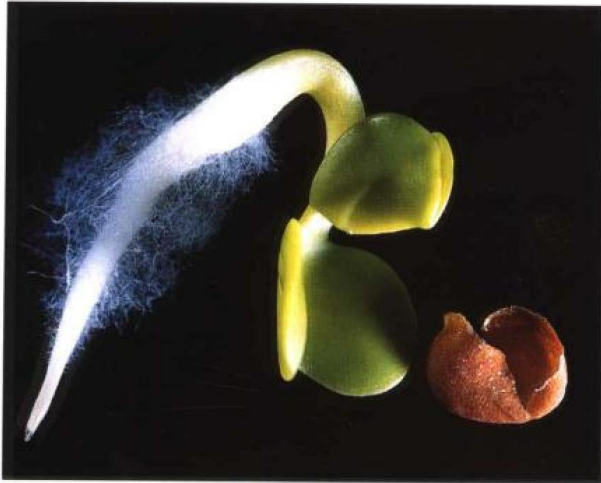


A prickly pear cactus<sup>17</sup> has a fibrous root system.

Another important job of roots is to absorb, or take in, water and minerals<sup>12</sup> from the soil. Look at the seedling<sup>13</sup> pictured on the next page. The threadlike<sup>14</sup> hairs coming off the main root are called root hairs. These hairy extensions<sup>15</sup> increase<sup>16</sup> the surface area of the root. This allows it to take in more water and minerals.

|                         |      |       |
|-------------------------|------|-------|
| 1. anchor               | v.   | 固定    |
| 2. absorb               | v.   | 吸收    |
| 3. chomp                | v.   | 使劲地嚼  |
| 4. gobble               | v.   | 狼吞虎咽  |
| 5. forkful              | n.   | 一叉的量  |
| 6. kid                  | n.   | 孩子    |
| 7. structure            | n.   | 结构    |
| 8. root system          |      | 根系    |
| 9. taproot              | n.   | 主根 直根 |
| 10. fibrous             | adj. | 纤维状的  |
| 11. spread out          |      | 展开 伸展 |
| 12. mineral             | n.   | 矿物    |
| 13. seedling            | n.   | 秧苗    |
| 14. threadlike          | adj. | 线状的   |
| 15. extension           | n.   | 延长    |
| 16. increase            | v.   | 增大    |
| 17. prickly pear cactus |      | 刺梨仙人掌 |





Root hairs sprout from a radish<sup>16</sup> seedling.

## Stems<sup>1</sup> Support and Carry

A beaver<sup>2</sup> bites<sup>3</sup>, pulls and tears out<sup>4</sup> pieces of wood. Finally, the tree begins to lean<sup>5</sup>. Timber<sup>6</sup>! After years of growing straight into the air, the tree slowly tips<sup>7</sup> and falls to the ground. The beaver digs into the tasty<sup>8</sup> bark<sup>9</sup>. This huge stem makes great meals for many days.

Trees and shrubs<sup>10</sup> have woody stems. These stems grow strong and thick over many years in order to support big plants. Smaller plants have softer, more flexible<sup>11</sup> stems.

Stems provide<sup>12</sup> support to plants. In most plants, this means the stem holds the leaves up so they can get enough sunlight. The other important function of stems is to transport<sup>13</sup> water and minerals from the roots to the leaves and to transport food from the leaves to other parts of the plant. Tubelike<sup>14</sup> structures inside the stems carry these necessities<sup>15</sup>.

|               |             |         |
|---------------|-------------|---------|
| 1. stem       | <i>n.</i>   | 茎 (树)干  |
| 2. beaver     | <i>n.</i>   | 海狸      |
| 3. bite       | <i>v.</i>   | 咬       |
| 4. tear out   |             | 撕下 扯下   |
| 5. lean       | <i>v.</i>   | 倾斜      |
| 6. timber     | <i>n.</i>   | 倒啦      |
| 7. tip        | <i>v.</i>   | 倾斜      |
| 8. tasty      | <i>adj.</i> | 好吃的     |
| 9. bark       | <i>n.</i>   | 树皮      |
| 10. shrub     | <i>n.</i>   | 灌木      |
| 11. flexible  | <i>adj.</i> | 柔韧的 易曲的 |
| 12. provide   | <i>v.</i>   | 提供      |
| 13. transport | <i>v.</i>   | 传送 运输   |
| 14. tubelike  | <i>adj.</i> | 管状的     |
| 15. necessity | <i>n.</i>   | 必需品     |
| 16. radish    | <i>n.</i>   | 萝卜      |
| 17. gnaw      | <i>v.</i>   | 咬 啃     |
| 18. trunk     | <i>n.</i>   | 树干      |



A beaver gnaws<sup>17</sup> on a tree trunk<sup>18</sup>.

## Leaves Produce Food

You may already know that almost all plants make their own food. Some plants, like the cactus, can make food in their stems. But most plants use their leaves to do this job. The substance<sup>1</sup> in leaves that gives them their green color is called chlorophyll<sup>2</sup>. Chlorophyll traps<sup>3</sup> energy<sup>4</sup> from sunlight. Then the important food-making process<sup>5</sup> of photosynthesis<sup>6</sup> can begin.

What's so important about photosynthesis? It not only provides plants with food but also provides us with oxygen. There are two main steps in photosynthesis. In the first step, chlorophyll traps light energy from the sun. The light energy is used to split<sup>7</sup> water into oxygen and hydrogen<sup>8</sup>. The oxygen goes into the air.

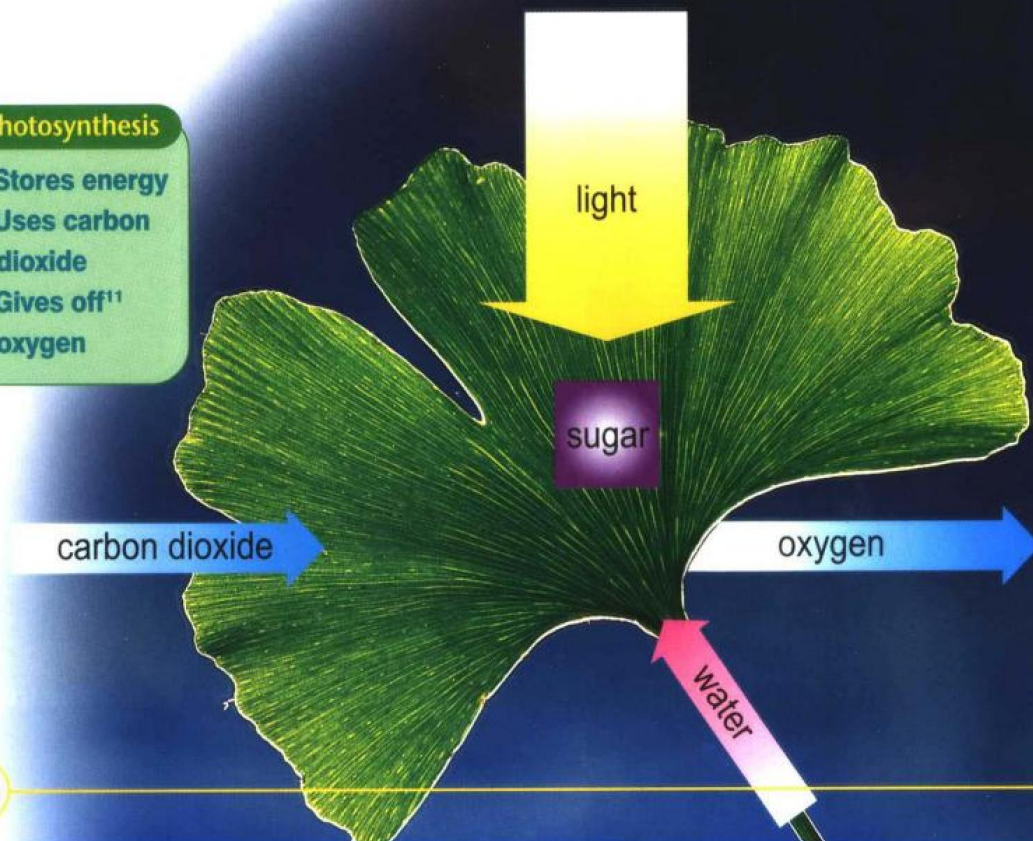
In the second step of photosynthesis, the hydrogen is combined with<sup>9</sup> carbon dioxide to make sugar<sup>10</sup>. The sugar is stored as food for the plant.

|                   |     |       |
|-------------------|-----|-------|
| 1. substance      | it. | 物质    |
| 2. chlorophyll    | it. | 叶绿素   |
| 3. trap           | v.  | 留住·聚集 |
| 4. energy         | it. | 能量    |
| 5. process        | it. | 过程    |
| 6. photosynthesis | it. | 光合作用  |
| 7. split          | v.  | 分解    |
| 8. hydrogen       | it. | 氢     |
| 9. combine with   |     | 与……结合 |
| 10. sugar         | it. | 糖     |
| 11. give off      |     | 放出    |

## What Is Photosynthesis?

### Photosynthesis

- Stores energy
- Uses carbon dioxide
- Gives off<sup>11</sup> oxygen





Remember, plant cells<sup>1</sup> are alive<sup>2</sup>. So, just like animals, plants need food for energy. When a plant needs its stored food, its cells may use oxygen to break apart the sugars. This gives off energy in a process called respiration<sup>3</sup>. This energy-releasing<sup>4</sup> process can happen day or night.

### Respiration

- Releases energy
- Uses oxygen
- Gives off carbon dioxide

## Thinking Like a Scientist: observing<sup>5</sup>

Some of the most important breakthroughs<sup>6</sup> in science are made because of careful observations. To find out about an object<sup>7</sup>, or observe it, you can touch it, smell it, look at it, and even listen to it.

Look at the leaves pictured on this page. Although you can't really touch them, you can learn a lot by observing them closely. Try to match the description<sup>8</sup> with the picture.

### Types of Leaves

| Leaf                      | Description  |
|---------------------------|--|
| Ash <sup>9</sup>          | a compound <sup>10</sup> leaf with many small leaflets <sup>11</sup> |
| Maple <sup>12</sup>       | a simple leaf with only one flat blade <sup>13</sup>                 |
| Douglas fir <sup>14</sup> | many needlelike <sup>15</sup> leaves                                 |

- |                     |             |        |
|---------------------|-------------|--------|
| 1. cell             | <i>n.</i>   | 细胞     |
| 2. alive            | <i>adj.</i> | 活着的    |
| 3. respiration      | <i>n.</i>   | 呼吸(作用) |
| 4. energy-releasing |             | 能量释放   |
| 5. observe          | <i>v.</i>   | 观察     |
| 6. breakthrough     | <i>n.</i>   | 突破     |
| 7. object           | <i>n.</i>   | 物体     |
| 8. description      | <i>n.</i>   | 描述     |
| 9. ash              | <i>n.</i>   | 岑树     |
| 10. compound        | <i>adj.</i> | 复合的    |
| 11. leaflet         | <i>n.</i>   | 小叶     |

How are these types of leaves alike<sup>16</sup>? How are they different?



- |                 |             |          |
|-----------------|-------------|----------|
| 12. maple       | <i>n.</i>   | 枫树       |
| 13. blade       | <i>n.</i>   | 叶片       |
| 14. Douglas fir |             | 花旗松      |
| 15. needlelike  | <i>adj.</i> | 针状的      |
| 16. alike       | <i>adj.</i> | 相同的; 相似的 |



Growth and Survival:

# Ready, Set, Grow

生长与生存：生长过程

Giant sequoia<sup>1</sup>

(注释见第13页)

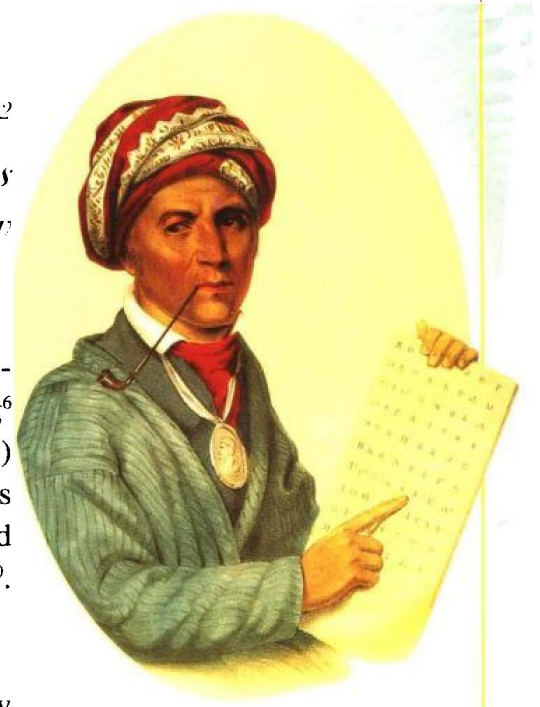




*How “giant” is a giant sequoia? It could shade<sup>2</sup> a jumbo jet<sup>3</sup>. It would take a classroom of kids holding hands to encircle<sup>4</sup> its trunk. It can grow taller than the Statue of Liberty<sup>5</sup>.*

**G**iant sequoias are among the largest and oldest living things on Earth. The trunks of these amazing<sup>6</sup> trees can grow to be more than 9 meters (30 feet) across. Because of its enormous<sup>7</sup> size, the giant sequoia is also known as the mammoth<sup>8</sup> tree. Giant sequoias are found only in California<sup>9</sup>, and most are protected in national parks<sup>10</sup>. The trees can live for more than 3,000 years.

It’s hard to believe that a tree as large as a sequoia can grow from a tiny<sup>11</sup> seed, but that’s exactly what happens. However, not all plants make seeds. For example, ferns<sup>12</sup> and mosses<sup>13</sup> grow from tiny structures called spores<sup>14</sup>. But most plants are seed plants. So how do seed plants grow? How do they make seeds to form new plants?



**The sequoia tree was named for a Cherokee Native American leader called Sequoyah, who created symbols<sup>15</sup> to represent<sup>16</sup> the Cherokee language.**

|                      |      |         |
|----------------------|------|---------|
| 1. sequoia           | n.   | 美洲杉     |
| 2. shade             | v.   | 遮蔽      |
| 3. jumbo jet         |      | 大型喷气式飞机 |
| 4. encircle          | v.   | 环绕 围绕   |
| 5. Statue of Liberty |      | 自由女神像   |
| 6. amazing           | adj. | 令人惊异的   |
| 7. enormous          | adj. | 巨大的     |
| 8. mammoth           | adj. | 巨大的     |
| 9. California        |      | 加利福尼亚州  |
| 10. national park    |      | 国家公园    |
| 11. tiny             | adj. | 极小的 微小的 |
| 12. fern             | n.   | 蕨类植物    |
| 13. moss             | n.   | 苔藓 地衣   |
| 14. spore            | n.   | 孢子      |
| 15. symbol           | n.   | 符号      |
| 16. represent        | v.   | 体现 表示   |
| 17. cluster          | n.   | 一束 一簇   |



**Clusters<sup>17</sup> of red spores on a fern leaf**