

Attainment's

# Explore **Biology**

Beyond the Basics

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# Explore Biology

## Student Book

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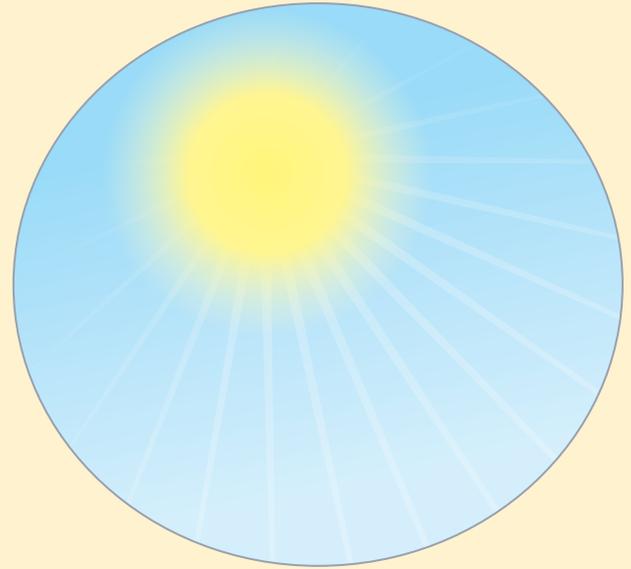
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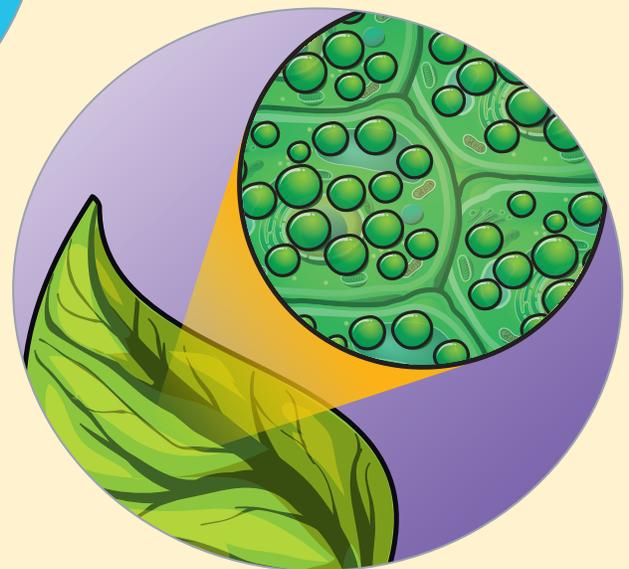


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**chapter**  
**6**

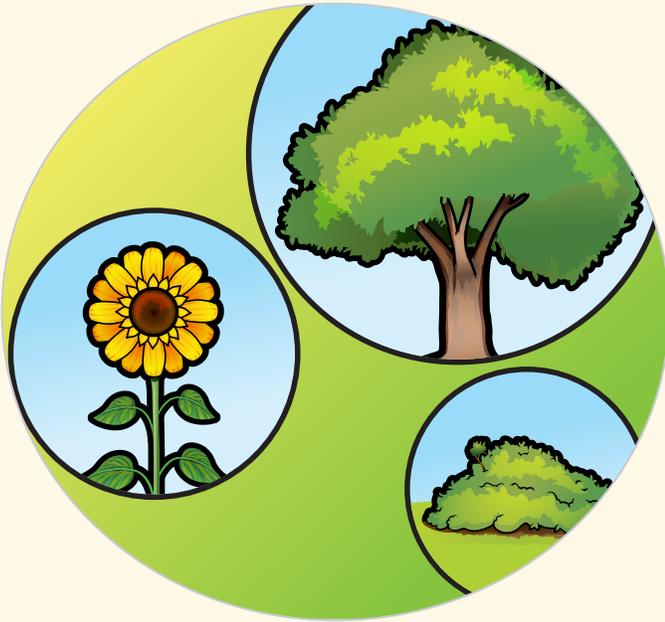


# Photosynthesis

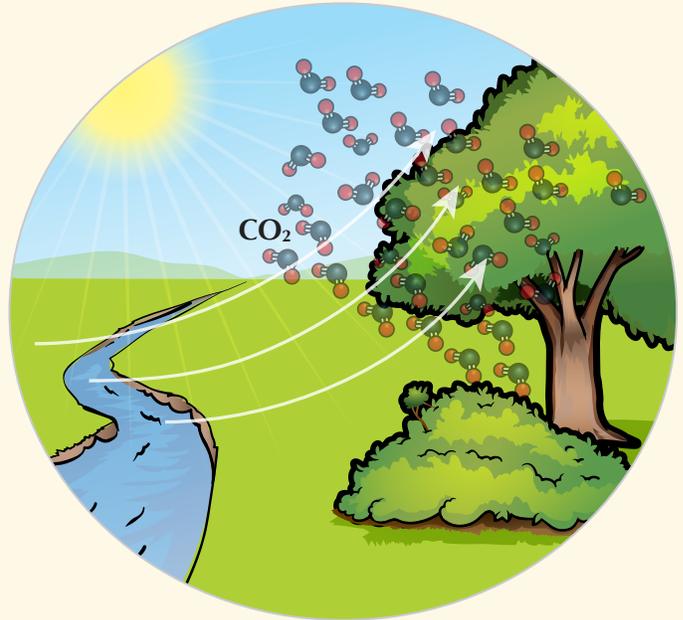




# big ideas



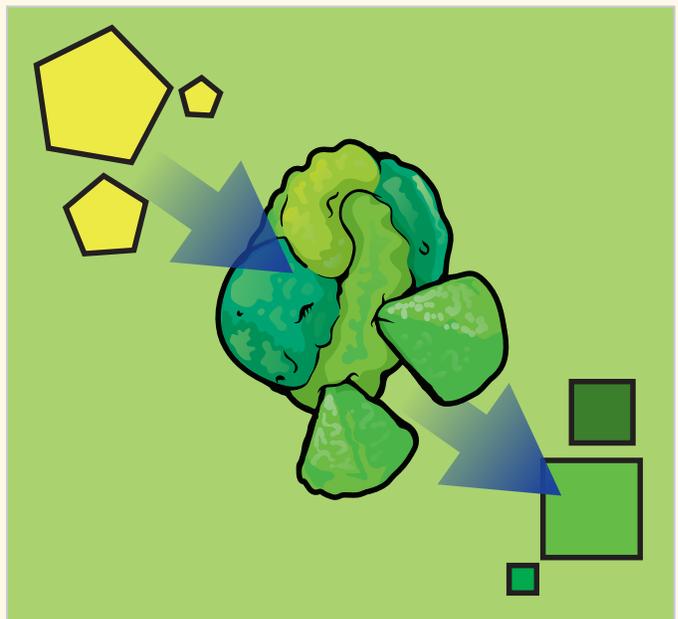
*Plants do photosynthesis.*



*Plants make food out of sunlight, CO<sub>2</sub>, and water.*



*Plants need sunlight to grow.*



*Photosynthesis is a chemical reaction.*

# Photosynthesis





# vocabulary



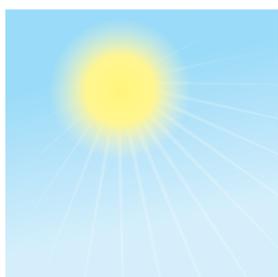
**plants**

Mostly green organisms that make their own food.



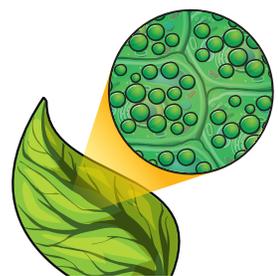
**photosynthesis**

The process that *plants* use to make their own food.



**sunlight**

Energy that comes from the sun as light.



**chloroplast**

The organelle that performs *photosynthesis*.



**They make their own food  
and are mostly green organisms.**

\_\_\_\_\_



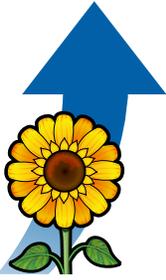
# vocabulary



**leaf**

A flat, usually green, part of a *plant*.

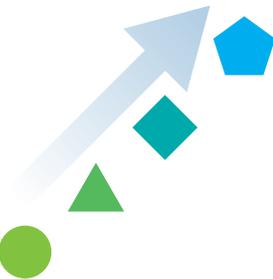
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**growth**

Increase in size.

---



**convert**

To make something change.

---



**sugar**

A sweet substance made of carbohydrates that gives organisms energy.

---



**To make something change.**

\_\_\_\_\_



## chapter 6 **overview**



*Forests are ecosystems with many trees.*

**Plants** use a special process called **photosynthesis** to make their own food. This way, they don't have to search for food. A few other organisms also use photosynthesis, including bacteria called cyanobacteria. However, they use it in a slightly different way. Both can make their own food using only air, water, and **sunlight**.



*Not all parts of a plant are green.  
Flowers can be many colors.*



## chapter 6 **overview**



*Humans need plants to survive.*

Humans and other organisms need plants because they release oxygen during photosynthesis. Oxygen is needed for survival. Because of plants, there is always enough oxygen in the air to live. Plants also need oxygen to survive. The relationship between plants and humans is very important. Without plants, many organisms could not exist.

# Plants



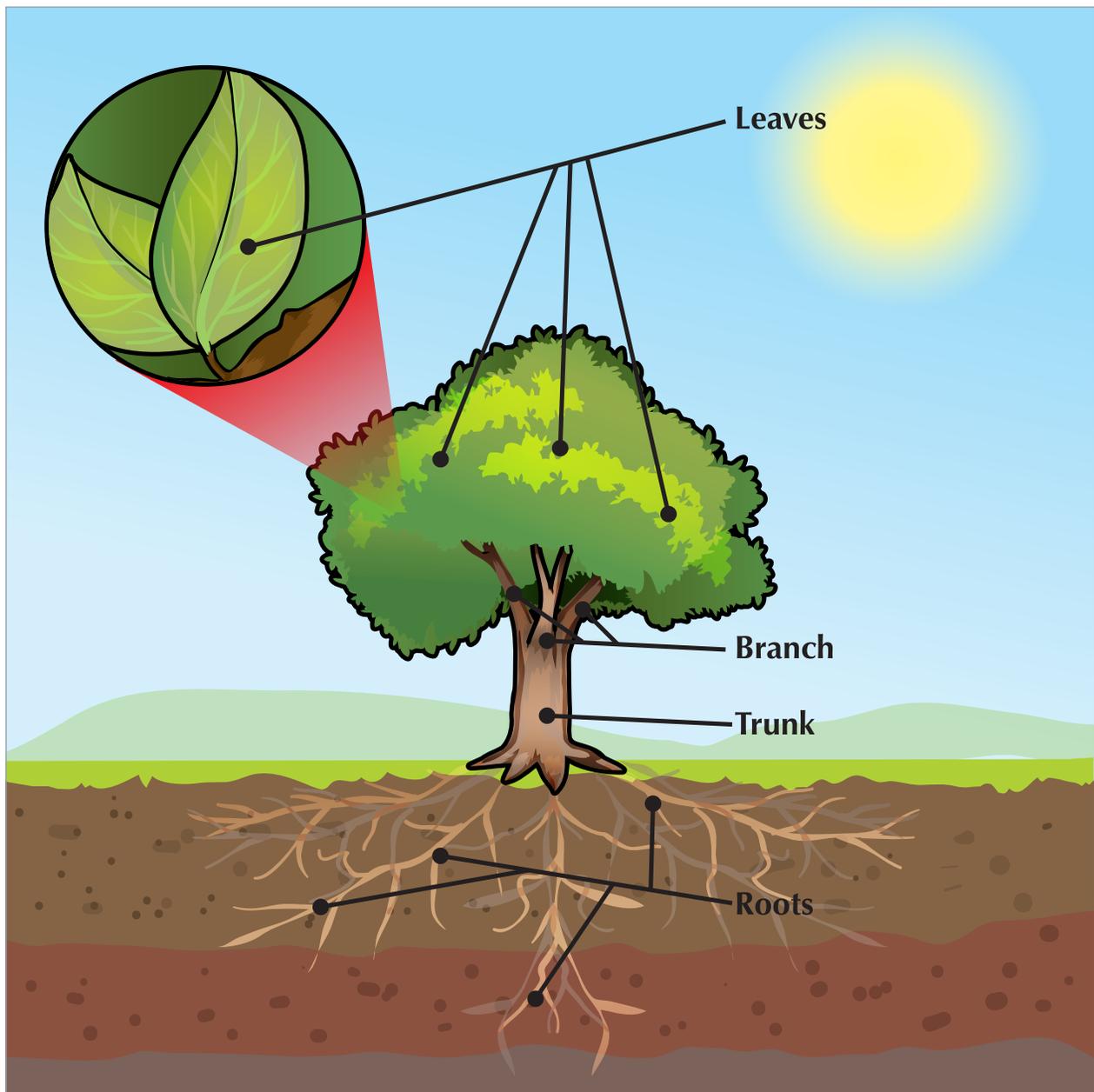
*Plants can be very colorful.*

Plants have very special organelles called **chloroplasts** that make photosynthesis possible. The **leaves** of plants perform most of the photosynthesis. Leaves work



*The leaves of a plant perform most of the photosynthesis.*

well because they are wide and flat, so there's a lot of room for light to hit. The **growth** and survival of plants are dependent on this process. It is performed by all plants, from giant trees to tiny blades of grass.



*Each part of a plant serves a purpose.*

Even though plants don't eat, they still need to drink. They use their roots to drink water from the soil, so it's important that plants get enough water. Plants also get other nutrients from the soil. Plants have all the characteristics needed to be alive. They just get food in a different way.

# Sunlight



*The sun gives Earth light and heat.*

The sun's light reaches Earth even though it's very far away.

This keeps Earth warm enough to support life. Sunlight has a lot of energy. The energy from sunlight is different from the type of energy found in ATP. Plants use the sun's energy to make food through photosynthesis. Some plants need more sunlight than others to grow and make food.

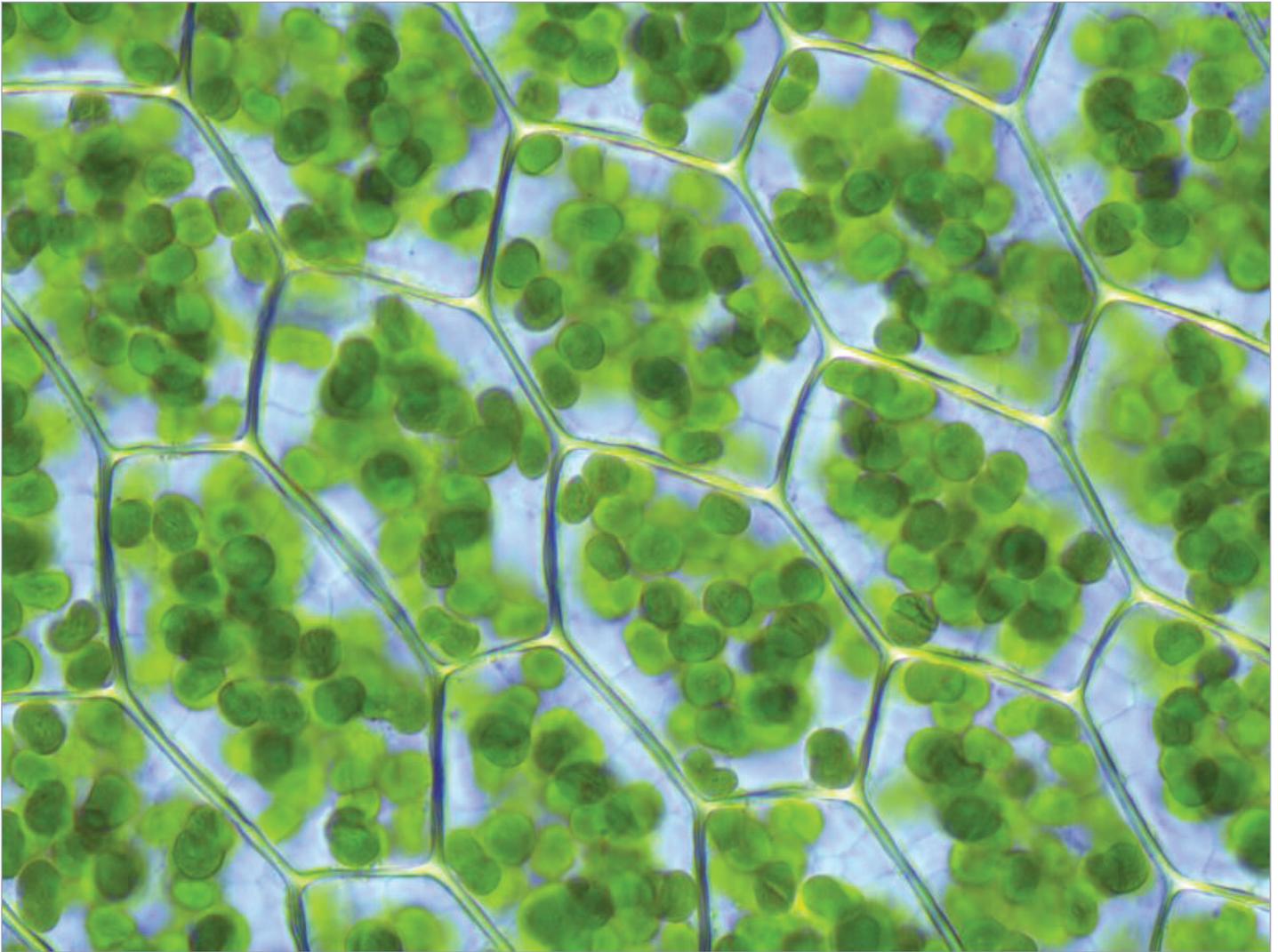


↑  
Sun

↑  
Earth

*The sun makes life on Earth possible.*

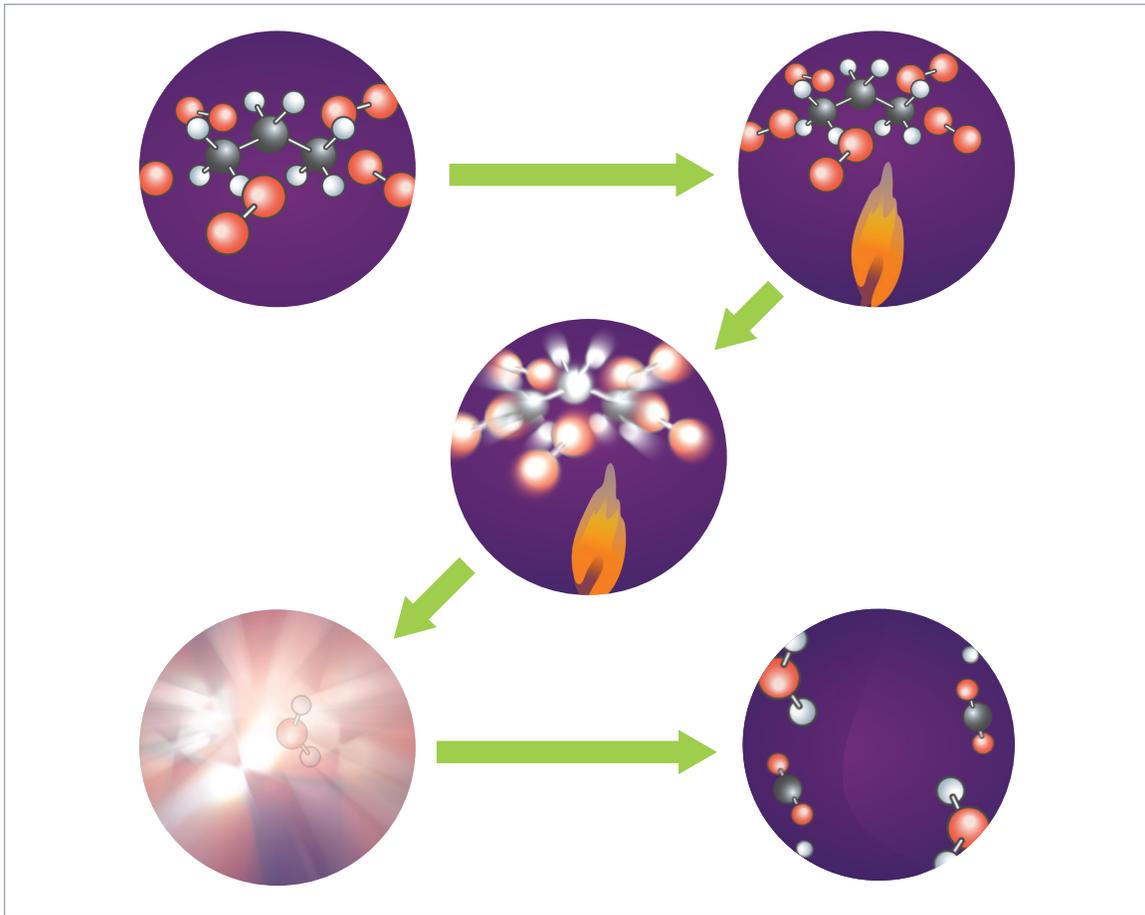
# Chloroplasts



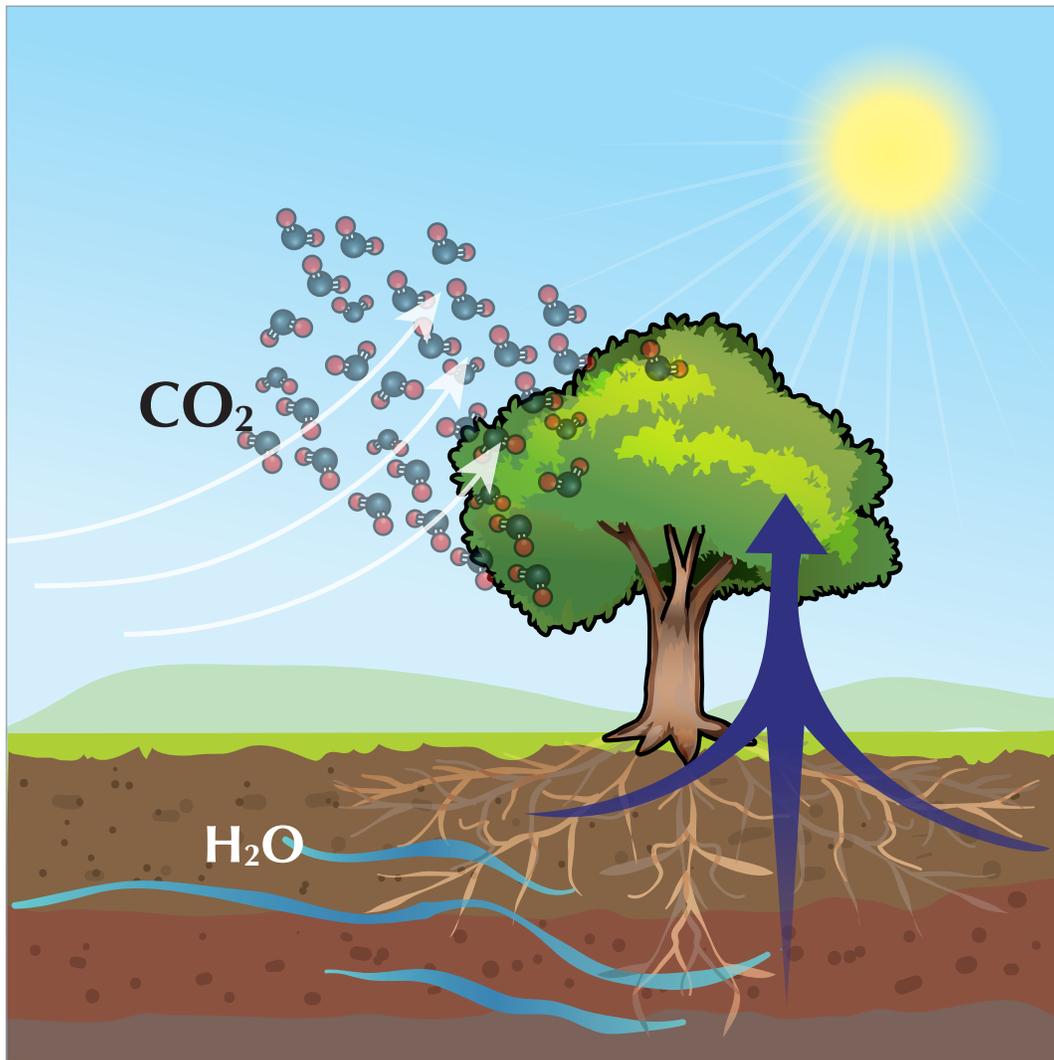
*There are many chloroplasts in a cell.*

Chloroplasts are the organelles in plant cells that perform photosynthesis. They have two membranes, much like mitochondria. One plant cell can contain up to 100 chloroplasts. Human and other animal cells don't have any. These organelles contain chlorophyll, which captures sunlight. Chlorophyll is a pigment that gives plants their green color.

# Chemical Reactions

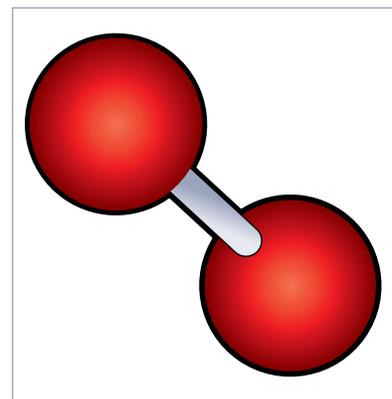


Photosynthesis is a series of chemical reactions that happens in all plants. Plants take carbon dioxide ( $\text{CO}_2$ ) and water ( $\text{H}_2\text{O}$ ) and **convert** them into oxygen ( $\text{O}_2$ ) and **sugar**. They do this by using the sun's energy. Plants turn the energy from sunlight into energy as ATP. This process also turns water into oxygen. Then that energy from ATP is used to convert carbon dioxide into sugar.



*Plants use the resources around them to get what they need.*

Plants use carbon dioxide from the air, water from the soil, and energy from the sun to make food in the form of sugar. Plants store these sugars. At night, when there is no sunlight, plants get all their energy from these sugars. They do this by performing cellular respiration. Plants don't use all the oxygen they make from photosynthesis, so they put some of it back in the air for humans and other organisms to breathe.



*Plants release oxygen that humans need to breathe.*



## Plant Competition

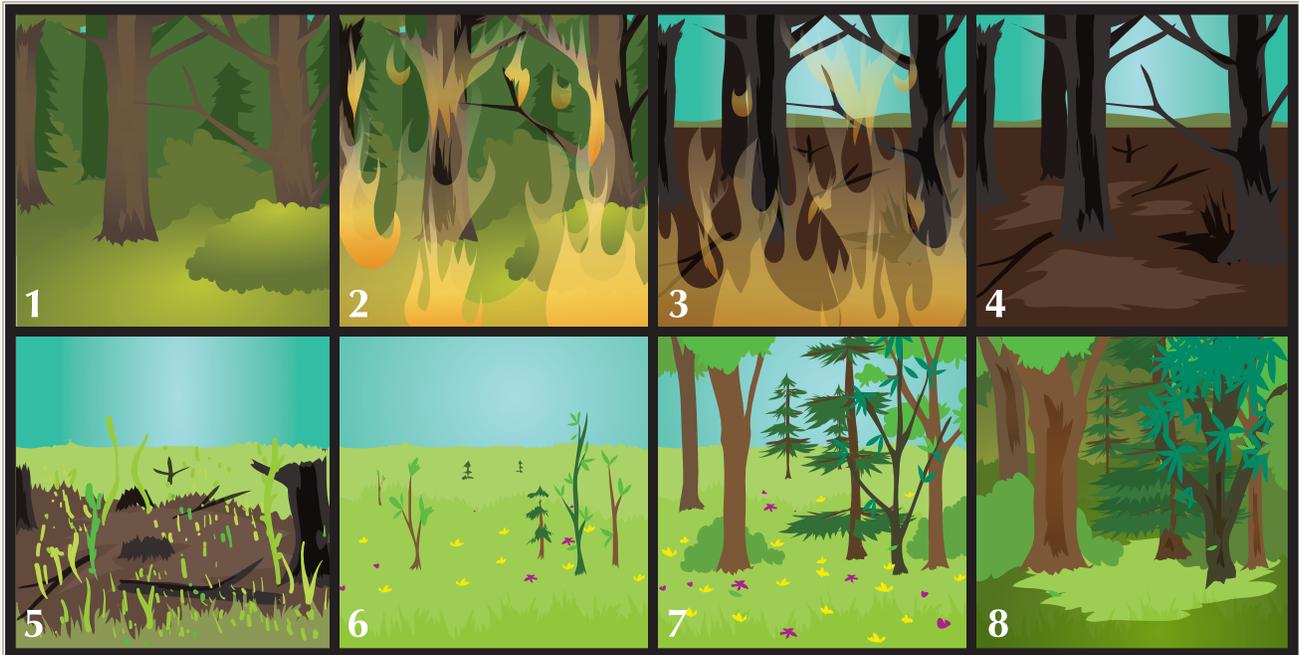


*Some plants change the direction they grow so they can get enough sunlight.*

Plants compete with each other for survival, just like all other organisms. They compete with surrounding plants for sunlight by growing larger leaves and taller stems. Plants can grow in very odd ways when other plants are blocking them from sunlight. Plants compete because they will die if they don't get enough sunlight.



# in focus



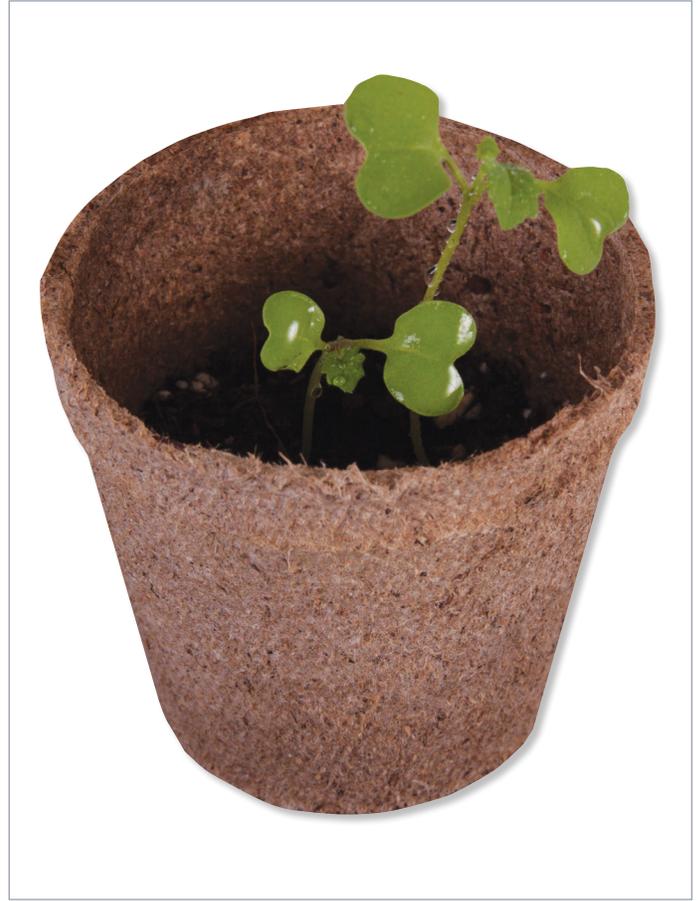
*Plant competition is most evident after an ecosystem is destroyed.*

Plants compete a lot after part of an ecosystem is destroyed.

Competition often happens after a fire burns everything. Certain plants grow back quickly after a fire. Other plants take a while to grow but are better at competing for sunlight and other resources. Eventually, the best competitors will dominate the ecosystem until it's destroyed again.



# lab



## Student? Questions:

1. Circle which is better for plants.

no sunlight

sunlight

no water

2. Circle the group of plants that grew better.

in the light

in the dark

neither

3. Circle the color of the plant when it grows.

blue

red

green



# quiz

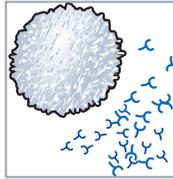
Circle the correct answer.

1. \_\_\_\_\_ do photosynthesis.

Plants



Antibodies

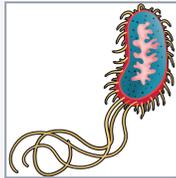


Humans



2. Plants make \_\_\_\_\_ out of sunlight, CO<sub>2</sub>, and water.

bacteria



food

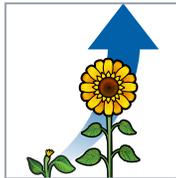


convert



3. Plants need sunlight to \_\_\_\_\_.

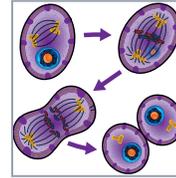
grow



sugar

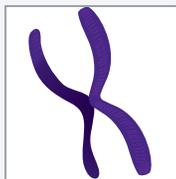


mitosis



4. \_\_\_\_\_ is a chemical reaction.

Chromosome



Photosynthesis



Sunlight

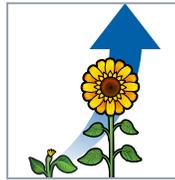


5. \_\_\_\_\_ are the organelles that perform photosynthesis.

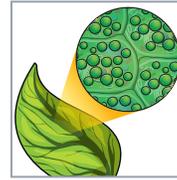
Phases



Growth

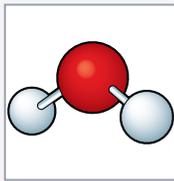


Chloroplasts



6. \_\_\_\_\_ are the flat and usually green part of plants.

Water



Sugar



Leaves

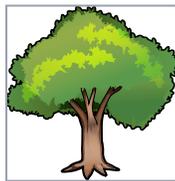


7. Energy that comes from the sun as light is known as \_\_\_\_\_.

sunlight



plants



embryo



write about it