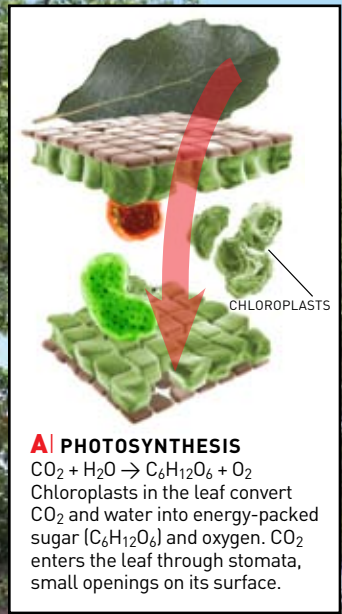




**F | RESPIRATION**  
 $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$   
 In a cell's mitochondria, nearly 80 percent of the sugar ( $C_6H_{12}O_6$ ) made via photosynthesis is used for energy. The end product,  $CO_2$ , escapes through stomata.



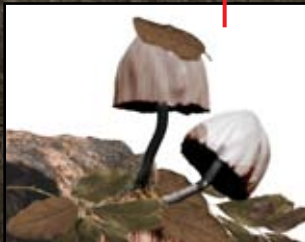
**A | PHOTOSYNTHESIS**  
 $CO_2 + H_2O \rightarrow C_6H_{12}O_6 + O_2$   
 Chloroplasts in the leaf convert  $CO_2$  and water into energy-packed sugar ( $C_6H_{12}O_6$ ) and oxygen.  $CO_2$  enters the leaf through stomata, small openings on its surface.

**E | DETRITUS**  
 When dead leaves and branches fall to the forest floor, they bring stored carbon along for the ride: two-thirds of a forest's captured carbon ends up on the ground or in the soil.



**B | TRUNK**  
 The layers of a tree's trunk act as its circulatory system. The inner bark transports sugar throughout the plant.

**C | ROOTS**  
 Both roots and mycorrhizae, or hairlike fungi, use sugars made via photosynthesis to grow, releasing  $CO_2$  as a by-product.



**D | DECOMPOSITION**  
 The accumulation of fallen leaves and branches (detritus) develops a rich carbon bank. Fungi and microbes decompose this dead matter, releasing  $CO_2$  to the air.



## THE CARBON EXCHANGE

**IN THE CARBON CYCLE**, it's not just about the individual tree—the entire forest plays a role. Leaves take in carbon dioxide, converting it to sugar, which is carbon-based. Some of the sugar is used immediately for energy, converted back to  $CO_2$ , and released into the atmosphere. The rest is stored in living wood or dead matter, such as fallen leaves and branches. Old-growth forests, in particular, store vast amounts of carbon while continuing to absorb  $CO_2$ . —MOLLY WEBSTER