

How does the level of light affect the rate of photosynthesis?

Answer 1:

In photosynthesis, the energy from the sun is used to turn carbon dioxide (CO₂) and water into sugar. Oxygen is a waste product.

More light can mean more photosynthesis. It doesn't necessarily mean more though. When we think of photosynthesis as a process, we can see that there are at least three things that can limit the process: **light, water, and carbon dioxide.** More light won't help if we don't have enough water and carbon dioxide.

Actually, most places on Earth have the same amount of carbon dioxide in the atmosphere, but a plant can only get it by opening holes in its leaves. These holes are too small for you to see without a strong microscope, but they are big enough to let water vapor out of the plant. So water is an important limit on a plant. More light is actually a problem if water is scarce, because even more water will evaporate from the plant.

This is an example of how increasing one factor (sunlight) can lead to another factor (water) being limiting.

How can you look at a landscape and tell whether a lot of photosynthesis usually happens there?

Answer 2:

So by level of light you probably mean light intensity which is something that can be measured. **Light intensity is usually defined as the energy hitting an area over some time period.** So in the case of a plant, a higher light intensity means more packets of light called "photons" are hitting the leaves. As you rise from low light intensity to higher light intensity, the rate of photosynthesis will increase because there is more light available to drive the reactions of photosynthesis. However, once the light intensity gets high enough, the rate won't increase anymore because there will other factors that are limiting the rate of photosynthesis. A limiting factor could be the amount of chlorophyll molecules that are absorbing the light. At a very high intensity of light, the rate of photosynthesis would drop quickly as the light starts to damage the plant.

Answer 3:

This is a very important aspect of photosynthesis. As you are probably aware, **Photosynthesis is a chemical reaction that captures light energy and turns it into sugar.** These sugars are then used by the plant as energy for any number of things. The process of photosynthesis requires three things: Light, Carbon dioxide and water. If any one of these things is in short supply, then photosynthesis cannot happen. When you increase the level of light, plants will photosynthesize more. But, if you have too much light, than the other 2 ingredients become limiting and photosynthesis can no longer increase with the level of light. When this occurs, leaves can experience sunburn damage. If you've ever seen a leaf with large dry brown sections on a living leaf, it is because that leaf experienced sunburn.

With too little light, photosynthesis cannot occur either and the plant suffers without the production of sugars. There are many complicating interactions between plants and light. I hope that you continue to investigate this as the story gets more interesting and exciting the deeper you go.

Answer 4:

Photosynthesis needs light, but it also needs other things, and too much light can create heat and dryness that are bad for photosynthesis. For this reason plants in different environments have different structures to help them get the right amount of light. **In rain forests, where there is plenty of water, trees grow very tall to reach as much light as they can. In deserts, plants use hairs or scales on their leaves to reduce the amount of light they receive to keep the light from driving the temperature up too high or causing the plants to dry out.**

Answer 5:

I am not sure what you mean by "level" of light, but I will answer your question in two ways - in terms of the intensity of light and wavelength of light.

Photosynthesis needs water, carbon dioxide, chlorophyll, light, and the right temperature. Light is an extremely important factor for the process. If there is enough water, carbon dioxide, and the temperature is right, light becomes the factor which will affect photosynthesis. Most of the time, **when the intensity of light is high, you will get a a greater rate of photosynthesis.** But, this rate has a limit, and once that limit is hit you can't increase the rate past that limit.

Chlorophyll is a green pigment in the chloroplast of the plant cell which

absorbs the light. This means it will absorb any wavelength of light which is not in the green spectrum of light. If you look at a spectrum from 400nm-700nm. The amount of light absorbed will increase until it reaches a peak at about 450nm (blue light). Then it will start decreasing and be very low (almost 0) through the 500-550nm (green light) and then it will increase again peaking at about 700nm (red and yellow light).