

Photosynthesis and limiting factors

Which organisms are the main producers of food and biomass?

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What is biomass?

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What does endothermic mean?

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Word equation for photosynthesis

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Symbol equation for photosynthesis

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What is the energy source for photosynthesis?

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What is a limiting factor?

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Name the three limiting factors of photosynthesis.

The mass of living material. Plants build it from the glucose made in photosynthesis.

Photosynthetic organisms: plants and algae.

carbon dioxide + water $\rightarrow$ glucose + oxygen, using light energy.

A reaction that takes in energy from the surroundings.

Light energy, absorbed by chlorophyll in the chloroplasts.



Temperature, light intensity and carbon dioxide concentration.

A factor in short supply that stops the rate of a process from increasing.

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Why does the rate of photosynthesis fall at high temperatures?

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What does a flat part of a rate graph tell you?

Photosynthesis and limiting factors **Higher tier**

How can you tell which factor limits a plateau when two factors interact?

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Two light intensity curves have different plateaus. What does the higher plateau show?

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Core practical: how is light intensity changed?

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Core practical: how is the rate of photosynthesis measured?

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Core practical: name three variables to control.

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Core practical: why is a heat shield or water bath used?

The factor being changed is no longer limiting. Another factor is.

The enzymes are denatured, because their active site changes shape, so substrates cannot bind.

The other factor, such as carbon dioxide concentration or temperature, was higher and was limiting the lower curve.

It is the factor that is in shortest supply. Increasing it raises the plateau.

Count the bubbles of oxygen released per minute, or measure the volume of gas collected.

By changing the distance between the lamp and the pondweed.

To keep the temperature constant, because the lamp warms the water.

Temperature, carbon dioxide concentration (sodium hydrogencarbonate) and the plant used.

Photosynthesis and limiting factors **Higher tier**

How is the rate of photosynthesis related to light intensity when light is limiting?

Photosynthesis and limiting factors **Higher tier**

State the inverse square law for light intensity.

Photosynthesis and limiting factors **Higher tier**

A lamp is moved to three times the distance. What happens to light intensity?

Light intensity is proportional to $1 \div \text{distance}^2$ from the light source.

Directly proportional.

It falls to one ninth ($1 \div 3^2$).