

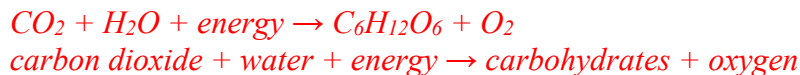
Carbon and Nitrogen Cycles

1. Photosynthesis.

(a) In what kind of organism does photosynthesis occur?

plants

(b) Write the chemical equation for photosynthesis. You may use words or chemical formulas.



(c) Where does the energy needed to drive photosynthesis come from?

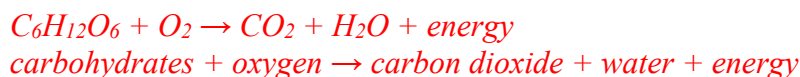
the sun

2. Cellular Respiration

(a) Where does cellular respiration occur?

Cellular respiration occurs in all living cells.

(b) Write the chemical equation for cellular respiration. You may use words or chemical formulas.



3. Nitrogen Fixation and Nitrification

(a) What is meant by “nitrogen fixation?”

The process converting atmospheric nitrogen into ammonia (or nitrates) so that it can be used by plants.

(b) Bacteria convert nitrogen from the air into what compound?

ammonia (NH₃)

(c) What do nitrifying bacteria do?

Nitrifying bacteria convert ammonia into nitrates.

4. Denitrification

- (a) How does nitrogen gas return to the atmosphere?

Denitrifying bacteria convert nitrates into nitrogen gas.

- (b) Does nitrogen need to return to the atmosphere to be reused by plants? Explain.

No.

When plants die, the nitrates are converted to ammonia by decomposers. This allows the nitrogen to be reused without converting it back to nitrogen gas.

5. Industrial Fixation

- (a) If natural nitrogen fixation processes are not sufficient, a farmer may put fertilizer on the plants. Suggest a way that nitrogen from a farmer's field could end up in a lake.

Run-off from a field could carry excess nitrogen into a river which will eventually end in a lake.