

Nutrient cycles

Revision notes · How carbon is cycled between the air, living things and fossil fuels by photosynthesis, feeding, respiration, decomposition and combustion.

For Cambridge IGCSE Combined Science 0653. **Supplement** is Extended content, only examined on Papers 2 and 4.

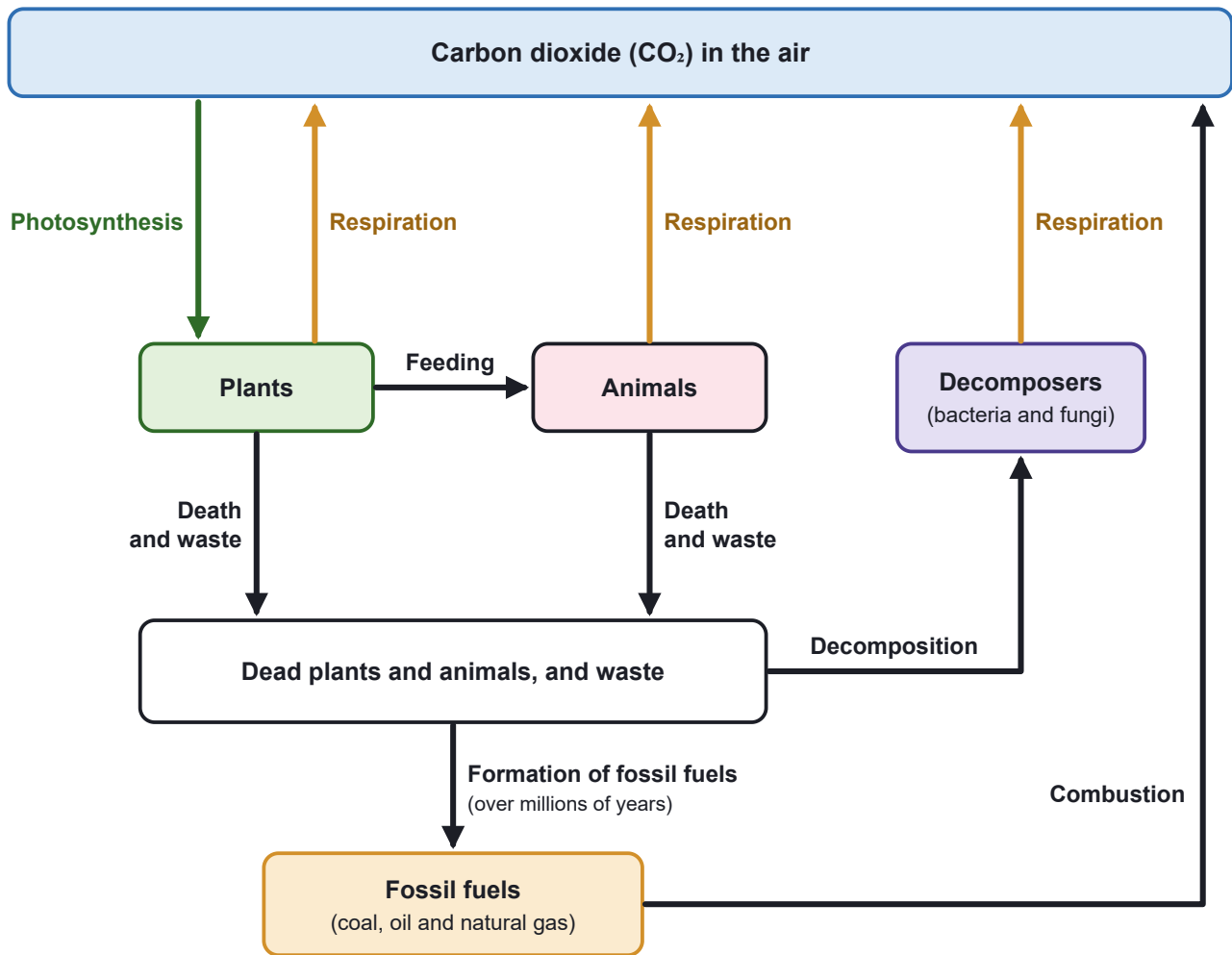
Nutrient cycles Spec B15.3

The carbon cycle Spec B15.3.1

All living things are made of carbon compounds, such as carbohydrates, proteins and fats. The carbon cycle moves carbon between the air, living organisms, dead material and fossil fuels. It makes sure carbon dioxide is available for plants to use in photosynthesis again.

1. Plants and algae take carbon dioxide from the air and use it in **photosynthesis** to make carbon compounds such as glucose, starch and proteins.
2. The carbon compounds pass along the food chain by feeding, when animals eat plants and other animals.
3. Plants, animals and decomposers all release carbon dioxide into the air by **respiration**.
4. When organisms die, and when they produce waste, **decomposers** (bacteria and fungi) break down the material. They release carbon dioxide into the air by respiration.
5. Over millions of years, some dead organisms are buried and do not decompose fully. They form **fossil fuels** (coal, oil and natural gas).
6. When fossil fuels, wood or other fuels are burned, **combustion** releases carbon dioxide into the air.

Processes in the carbon cycle	
Process	Effect on carbon dioxide in the air
Photosynthesis	Removes carbon dioxide from the air
Respiration (plants, animals, decomposers)	Adds carbon dioxide to the air
Decomposition	Adds carbon dioxide to the air, because decomposers respire
Combustion	Adds carbon dioxide to the air
Feeding	Passes carbon compounds from one organism to the next; no change in the air
Formation of fossil fuels	Locks carbon away in coal, oil and gas



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The carbon cycle. **Photosynthesis** removes carbon dioxide from the air; **respiration**, **decomposition** and **combustion** return it.

Exam tip: Name the process at every arrow. Photosynthesis takes carbon dioxide in. Respiration, decomposition and combustion put it back. Do not write 'breathing' for respiration.

Quick check

1. Which process removes carbon dioxide from the air?
2. Name three processes that add carbon dioxide to the air.
3. How are fossil fuels formed?

Quick check answers

Nutrient cycles

1. Photosynthesis.
2. Respiration, decomposition and combustion.
3. From dead organisms that were buried and did not decompose fully, over millions of years.