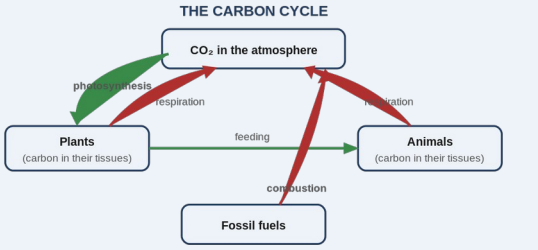
4.3 Cycles within Ecosystems

Mr Curran · practical-science.com

1. KEY VOCABULARY

TERM	MEANING
Carbon cycle	How carbon moves between the air, living things and fuels.
Water cycle	How water moves between the sea, air, land and living things.
Combustion	Burning — releases carbon dioxide.
Decomposition	Decomposers breaking down dead material, releasing CO_2.
Evaporation	Liquid water turning into water vapour.
Condensation	Water vapour cooling back into liquid water.

2. THE CARBON CYCLE



Decomposers release CO_2 when they break down dead plants and animals. Fossil fuels formed from ancient organisms.

3. CARBON — IN AND OUT OF THE AIR

CO_2 is removed from the air by: photosynthesis.
CO_2 is added to the air by: respiration, combustion of fuels, and decomposition of dead material.
Carbon passes along food chains when organisms feed.

4. THE WATER CYCLE

1. Evaporation — the Sun heats water in seas and lakes into vapour (plants also lose vapour by transpiration).
2. Condensation — vapour rises, cools and forms clouds.
3. Precipitation — water falls as rain or snow, and runs back to the sea.

5. THE ROLE OF DECOMPOSERS

Decomposers (bacteria and fungi) break down dead plants, dead animals and waste.
This releases CO_2 back into the air and returns mineral nutrients to the soil, so they can be reused.

6. THE WHY

Why cycles matter: the Earth has a fixed amount of carbon and water — they must be recycled, or living things would run out of the raw materials they need.
Why decomposers are essential: without them, nutrients would stay locked in dead bodies and never be returned to the ecosystem.

7. COMMON EXAM MISTAKES

✗ "Only animals add CO_2 to the air."
✓ Respiration (all organisms), combustion AND decomposition add CO_2.
✗ "Photosynthesis adds CO_2 to the air."
✓ Photosynthesis REMOVES CO_2 from the air.
✗ "Transpiration is part of the carbon cycle."
✓ Transpiration is part of the WATER cycle.

8. SELF-CHECK · cover & quiz

Can you…

1. Name the processes that remove and add CO_2 to the air?
2. Describe the carbon cycle from air → plant → animal → air?
3. Describe the three main stages of the water cycle?
4. Explain the role of decomposers in both cycles?
5. Explain why nutrient cycles are essential for life?