

2.5.4 The Carbon Cycle

A closed system

(Course Companion p. 139)

The importance of Carbon

- Provides the chemical framework for molecules of organic compounds, which make up living organisms

The Carbon Cycle - Stores

- carbon stores include:
 1. sedimentary rocks & fossil fuels (soil)
 2. living plants & organisms (biomass)
 3. Oceans
- Where's the rest?
 4. In the atmosphere as carbon dioxide

Carbon Cycle Processes

- Carbon is passed from the atmosphere, as carbon dioxide, to living organisms
- Carbon passed from one organism to the next in complex molecules
- Carbon is then returned to the atmosphere as carbon dioxide again

Carbon Cycle Processes

- Carbon is passed from the atmosphere, as carbon dioxide, to living organisms
PHOTOSYNTHESIS
- Carbon passed from one organism to the next in complex molecules
ASSIMILATION
- Carbon is then returned to the atmosphere as carbon dioxide again
RESPIRATION

1. Photosynthesis

- Photosynthesis is the way that plants make their food using energy from **sunlight**.
- Plants make sugar and use some of it for energy to keep them alive (**respiration**) but they also use some for growth and repair by making **fats** and **proteins**.
- Carbon fixation: plants capture (take in) CO₂

2. Transfer of carbon from one organism to the next (Assimilation)

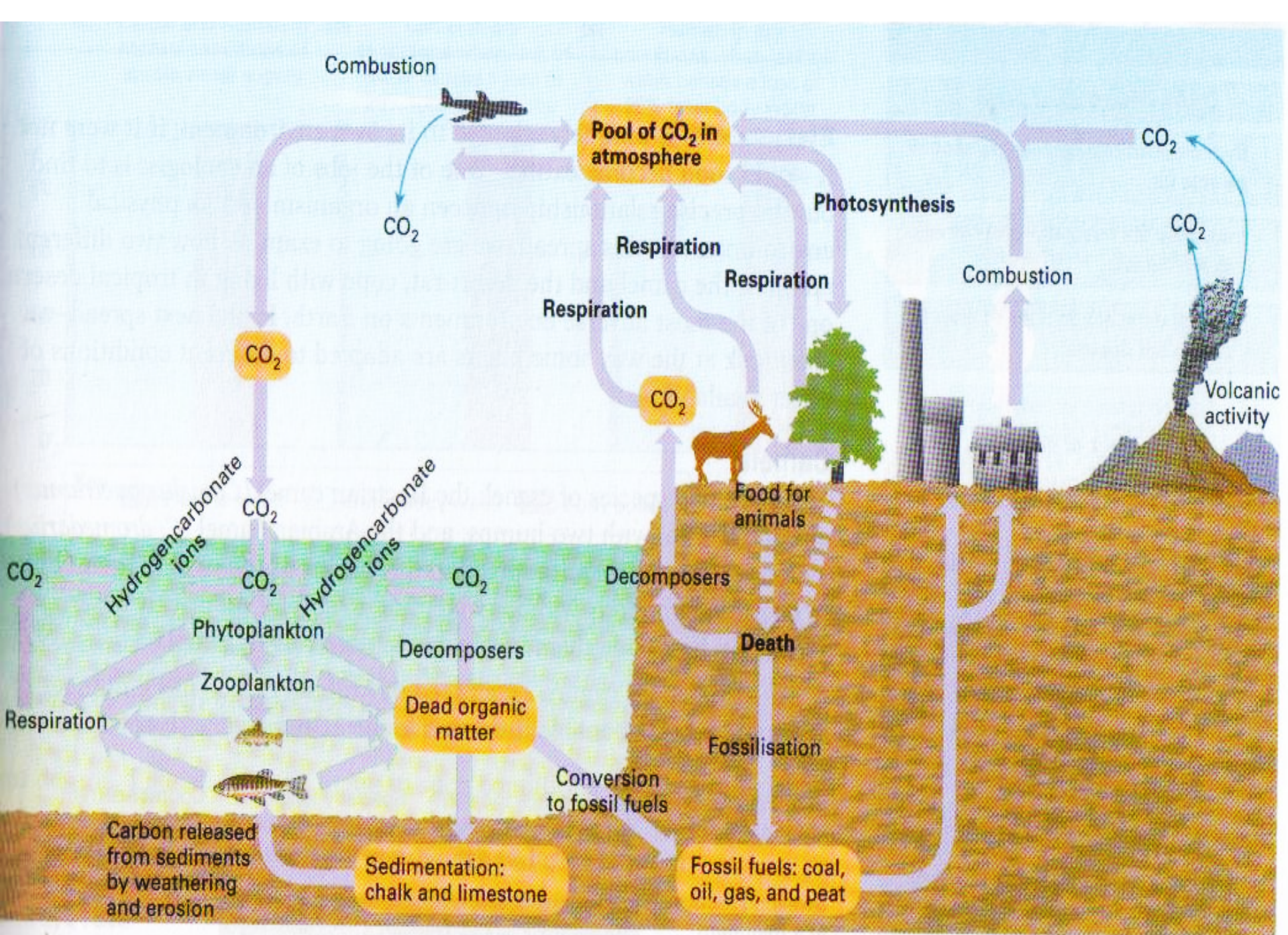
- When an animal eats a plant, carbon from the plant becomes part of the fats and proteins in the animal.
- Microorganisms and some animals feed on waste material from animals, and the remains of dead animals and plants.
- The carbon then becomes part of these microorganisms and detritus feeders

Assimilation (Secondary Productivity) :

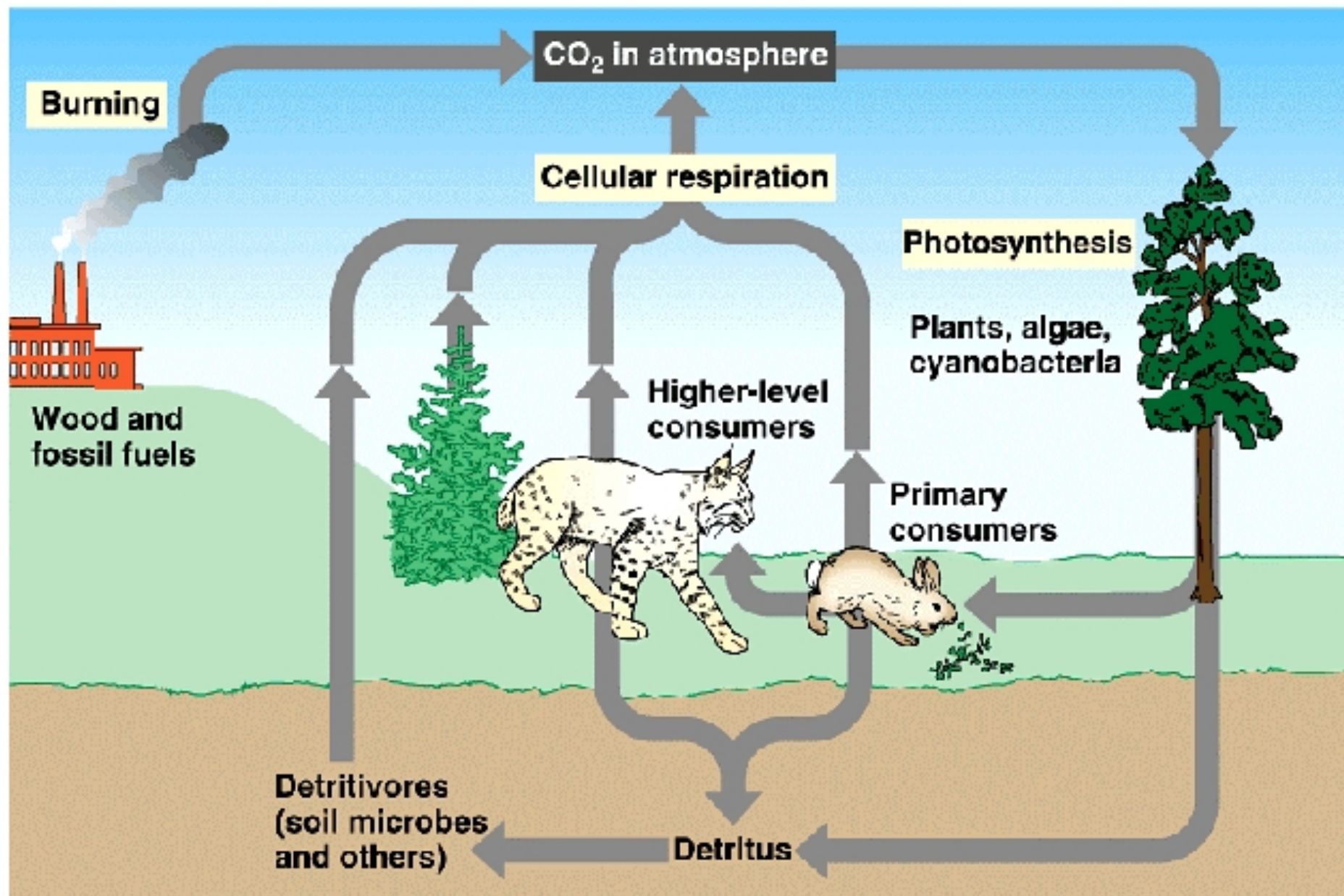
- The conversion of food into a useable form that is incorporated into the tissues and organs following the processes of digestion.

3. Respiration

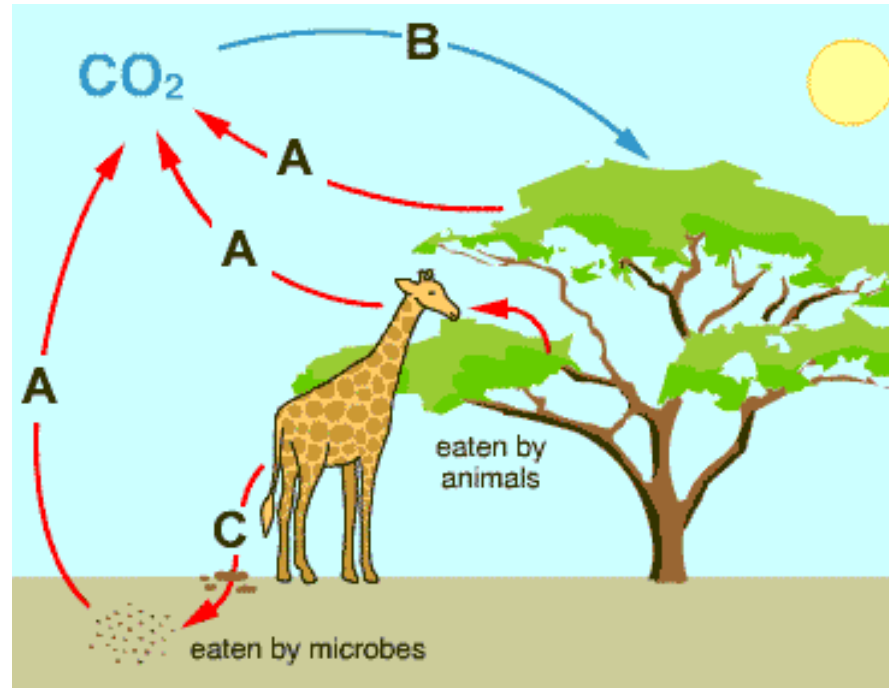
- the process in which molecules are converted into usable energy
- energy is released and used while the waste products (outputs) are carbon dioxide and water
- So what was that formulat again? ;)



The carbon cycle



Carbon Cycle Processes

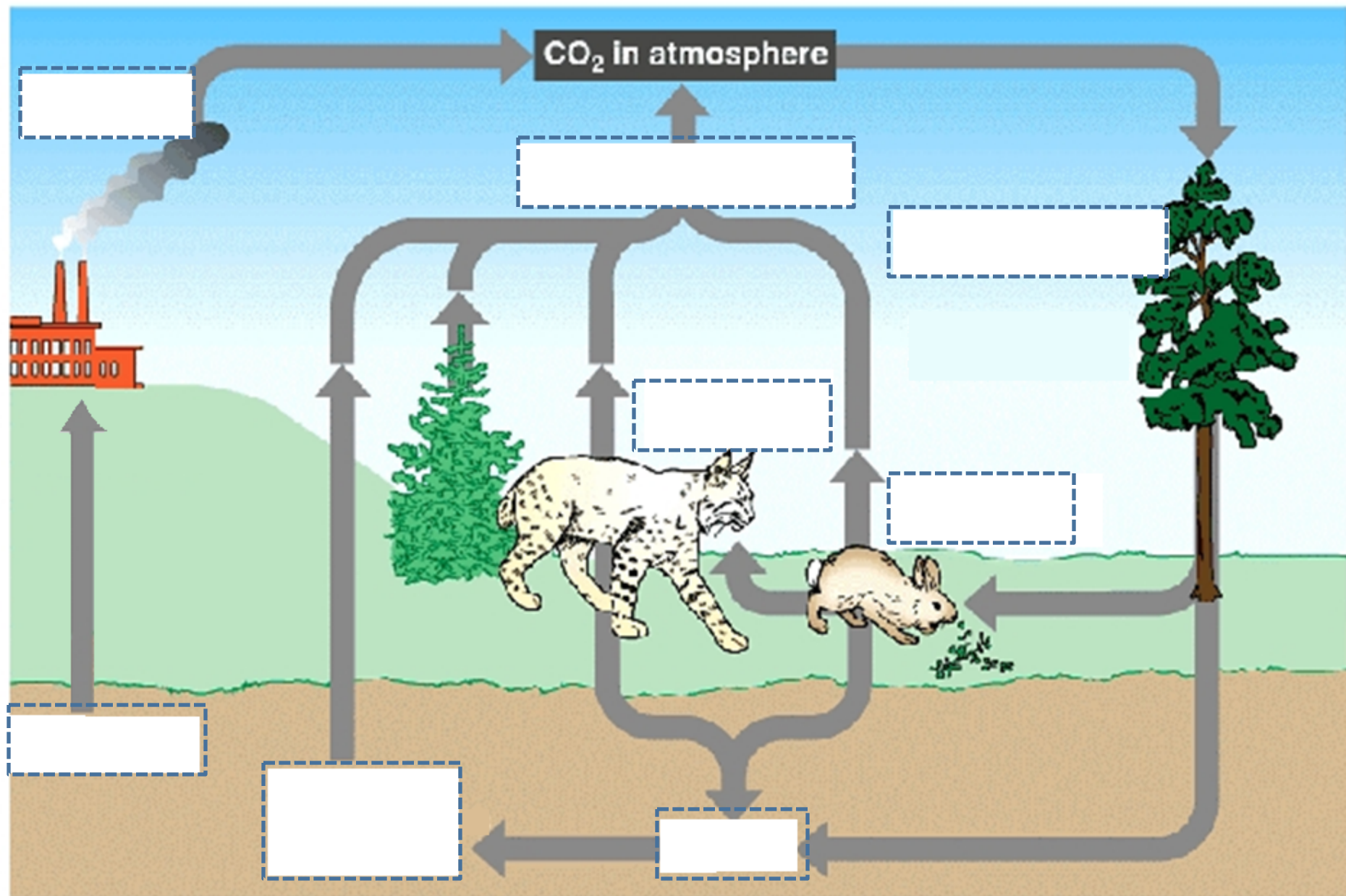


- A is photosynthesis, B is respiration and C is decay.
- A is respiration, B is photosynthesis, and C is decay.
- A is decay, B is photosynthesis, and C is respiration

Carbon sinks & sources

- Carbon sinks:
 - When the stores take in more carbon than they release
- Carbon sources:
 - When the stores release more carbon dioxide than they take in

The carbon cycle



Class work

- Jill Rutherford text book Course Companion
p. 138/9 read and complete in full: Qs 1, 2 & 3
- Complete questions on biozone handout