**4.7.2.2 How materials are cycled – Year 10 Biology Self Study**

**Facts**

* All materials in the living world are recycled to provide the building blocks for future organisms
* The carbon cycle returns carbon from organisms to the atmosphere as carbon dioxide and can be used by plants in photosynthesis
* Key parts of the carbon cycle:
  + Animals, plants, microorganisms add CO2 to the atmosphere when they respire
  + Plants take in CO2 and carry out photosynthesis to make glucose
  + When animals eat plants or other animals, the carbon is taken in and used to build molecules e.g. carbohydrates, fats and proteins
  + When animals and plants die, they decompose
  + Microorganisms (bacteria and fungi) will break down dead animals and plants, they will respire adding more carbon dioxide
  + Combustion of fossil fuels add CO2 into the atmosphere
* The water cycle provides fresh water for animals and plants, before being drained into the sea
* Water is constantly being evaporated and precipitated

**Task 1: Watch free Science lessons (if you can) and write notes on key ideas**

* GCSE Science Biology (9-1) The Carbon Cycle
* GCSE Science Biology (9-1) The Water Cycle
* <https://www.youtube.com/watch?v=r75NL3gN5yU> - another carbon cycle video
* [https://www.youtube.com/watch?v=1r10LqX9kxA](http://www.bbc.co.uk/schools/gcsebitesize/science/add_aqa/foodchains/foodchainact.shtml) - another carbon cycle video

**Task 2: Answer these Questions**

1. What is the carbon cycle?
2. What are the main processes involved in the carbon cycle?
3. Why is the carbon cycle so important for life on Earth?
4. Explain carefully how carbon is transferred through an ecosystem.
5. What are the main sources of carbon on Earth?
6. What role does respiration have in the carbon cycle?
7. What role does photosynthesis have in the carbon cycle?
8. What molecules is carbon dioxide turned into in plants and animals?

**Task 3: Make a diagram of on the Carbon Cycle & Water Cycle**

Use the information provided and the videos to construct a diagram of how the different processes are linked in the carbon cycle. You should include diagrams.

Do the same for the water cycle.

**Task 4: Copy and Complete the gap fill – Carbon Cycle**

The constant \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of carbon is called the carbon cycle. In the carbon cycle \_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_ is removed from the environment by green plants for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Some of the carbon dioxide is returned to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_ when green plants \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. When green plants are \_\_\_\_\_\_\_\_\_ by animals and these animals are eaten by other \_\_\_\_\_\_\_\_\_\_\_, some of the carbon becomes part of the \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ which make up their bodies. When animals \_\_\_\_\_\_\_\_ some of this carbon becomes \_\_\_\_\_\_\_ \_\_\_\_\_ and is released into the \_\_\_\_\_\_\_\_\_\_\_. When plants and animals \_\_\_\_\_\_, some animals and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ feed on their bodies. Carbon is released into the atmosphere as carbon dioxide when these organisms \_\_\_\_\_\_\_\_\_\_\_\_.

**Task 5: Decide if these statements are true or false. If the statement is false, you must explain why.**

* Green plants use carbon dioxide in photosynthesis.
* Combustion removes carbon from the atmosphere
* The largest store of carbon is the atmosphere
* Respiration adds carbon dioxide to the atmosphere
* Respiration only occurs in animals
* Decomposers remove carbon dioxide from the atmosphere
* Increasing carbon dioxide may cause global cooling
* Fossil fuels represent a huge (but decreasing) store of carbon
* Energy is transferred from plants to animals to decomposers
* Respiration releases energy to the environment in the form of heat

**Task 6: Write a glossary of the following key words. You could present this in a table.**

*Photosynthesis, combustion, respiration, decomposition, carbon cycle, water cycle, transpiration, evaporation, precipitation, clouds, surface water, condensation, ground water, surface water.*

**Task 7: Exam Question**

Some insects die. Describe how the carbon in the dead insect bodies may be recycled [6marks]

**Task 8: Write a story about a rain droplet.**

You can make the droplet into a character and be creative. You need to explain the journey of the droplet from the sea to the air and land around the water cycle. If you would prefer to complete this as a storyboard instead, that is fine.

You should include the following words: *transpiration, evaporation, precipitation, clouds, surface water, condensation, ground water, surface water.*