How is carbon cycled?

Learning objectives

1 Identify key processes in the carbon cycle.

2 Describe the carbon cycle.

Prior knowledge questions

1. In what form is carbon in the atmosphere?

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2. Which process in living organisms removes carbon dioxide from the atmosphere?

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3. Which process in living organisms releases carbon dioxide into the atmosphere?

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4. What is the word equation for aerobic respiration? Circle the forms of carbon in the equation.

_____ + _____ → _____+_____

5. What is the word equation for photosynthesis? Circle the forms of carbon in the equation.

_____ + _____ → _____+_____

Carbon cycle questions

1. Look at the table below.

Process	Mass of carbon transferred (gigatons/year)
Land plant photosynthesis	123
Aquatic plant photosynthesis	92
Land plant and animal respiration	60
Land decomposers respiration	60
Aquatic respiration	90
Human activity	9

(Source - https://earthobservatory.nasa.gov/features/CarbonCycle)

(a) What is the total mass of carbon being transferred each year by photosynthesis?

_____

(b) What is the total mass of carbon being transferred each year by respiration?

_____

(c) What human activity accounts for 9 gigatons of carbon being transferred each year?

_____

(d) Use all the information in the table to calculate the net transfer of carbon into the atmosphere.

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2. Sketch your own carbon cycle, on a separate piece of paper, to show the transfers of carbon between the atmosphere and living organisms.

3. The natural carbon cycle does not include human activity. Explain how the natural cycle keeps the concentration of carbon dioxide in the atmosphere fairly constant.

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Challenge

4. Scientists have to predict future carbon transfers to estimate the effect of rising carbon dioxide levels on our atmosphere, as carbon dioxide causes global warming. Referring to processes in the carbon cycle, how might the values shown in the table change over the course of a year, making this very difficult for scientists to estimate?