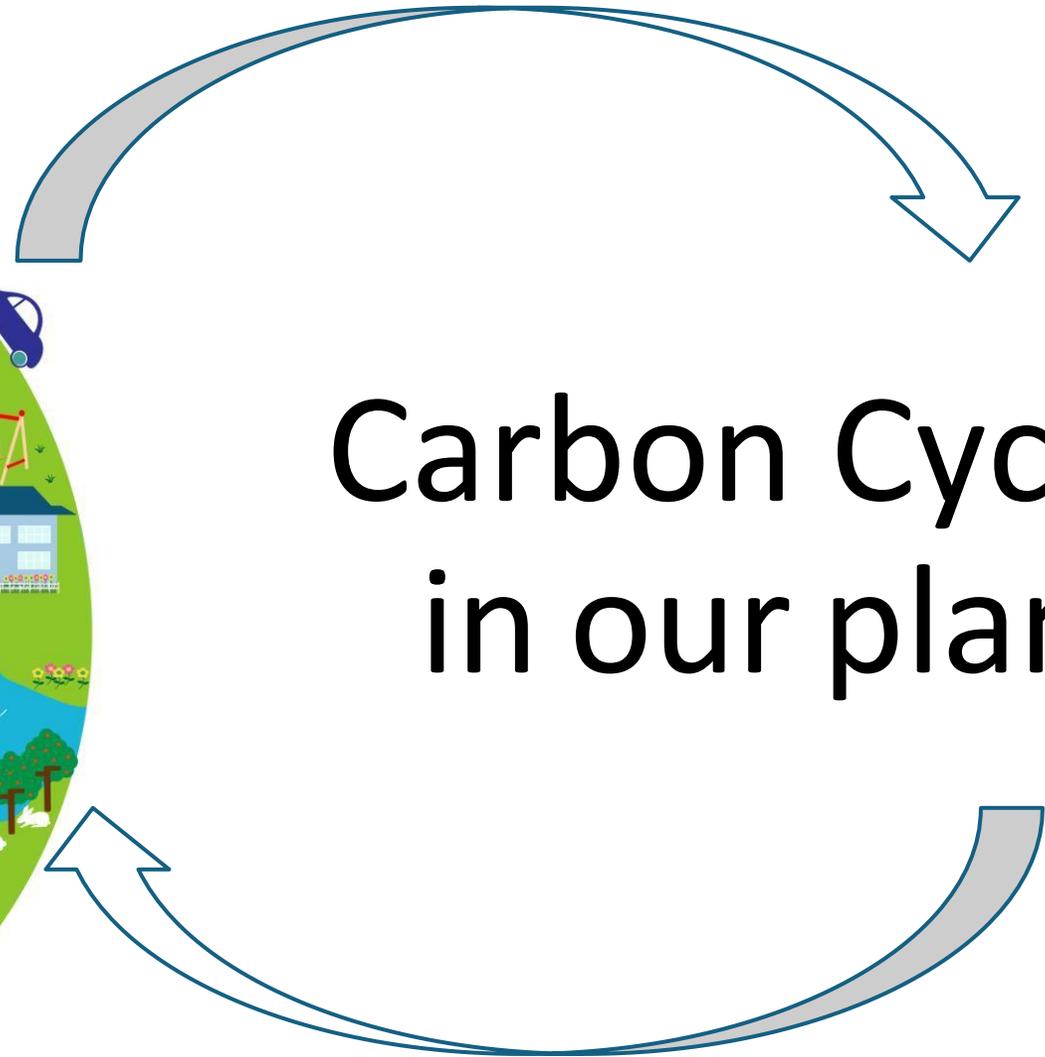




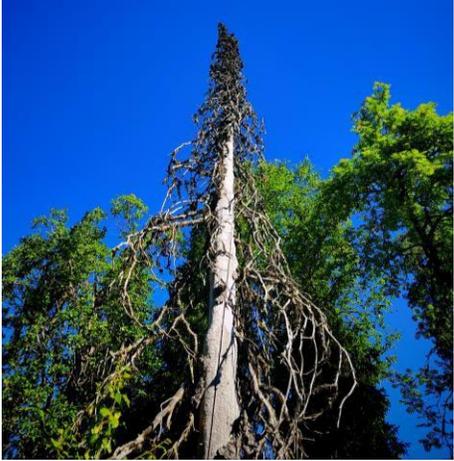
Carbon Cycling in our planet



**Where can you find
carbon ?**



Trees



cloudberry



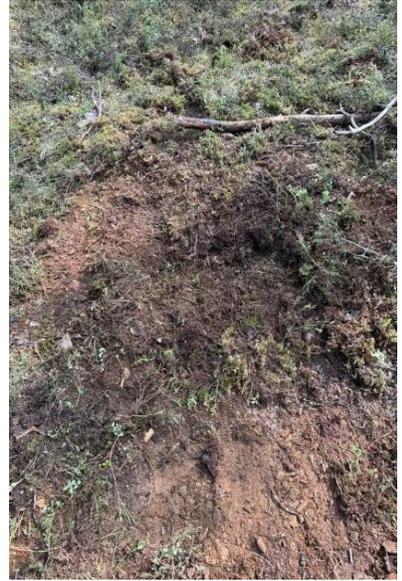
reindeer



butterfly



soil



smoke from industry



dishes



chocolate



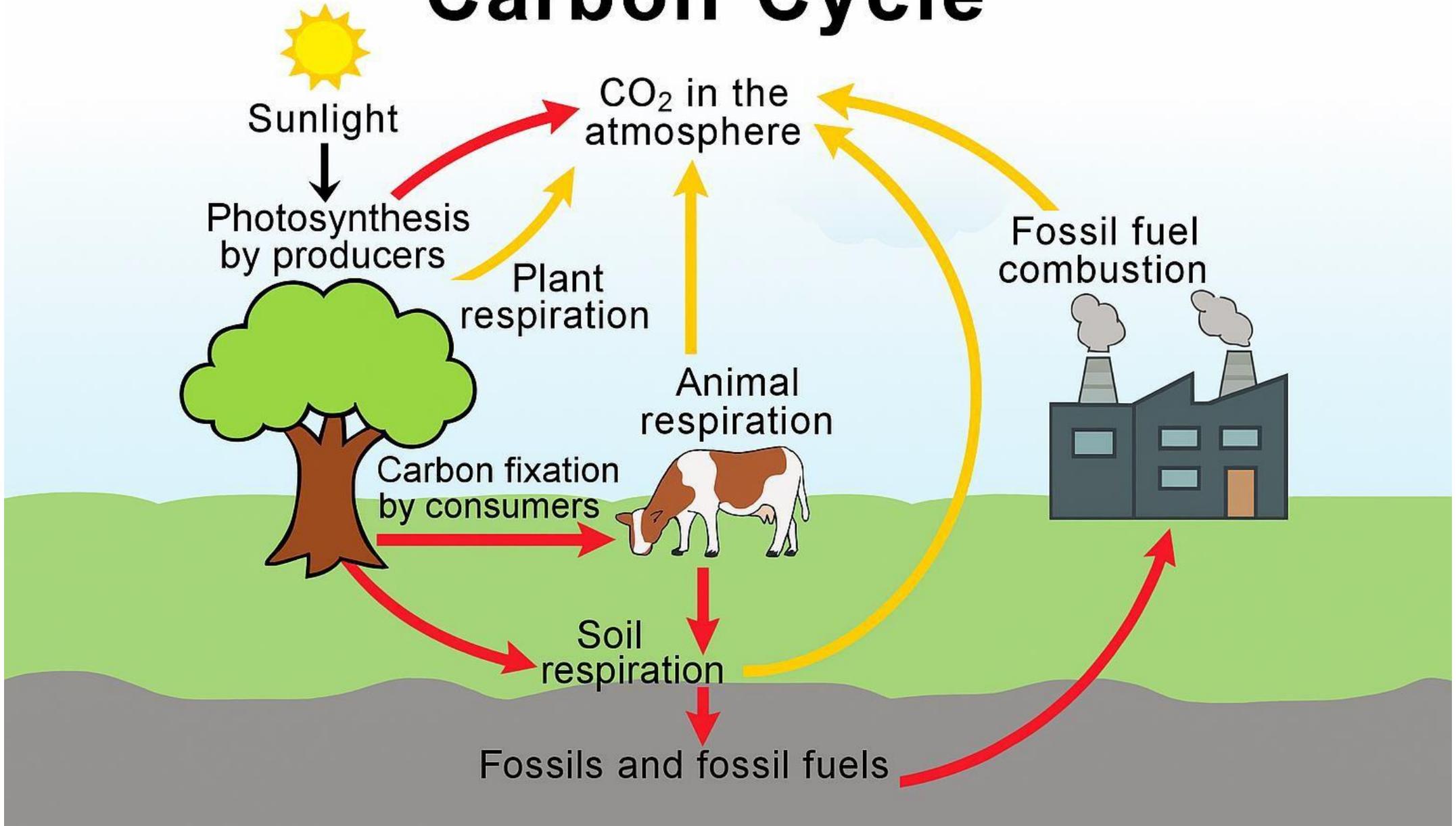
humans



**How does carbon
work our planet?**

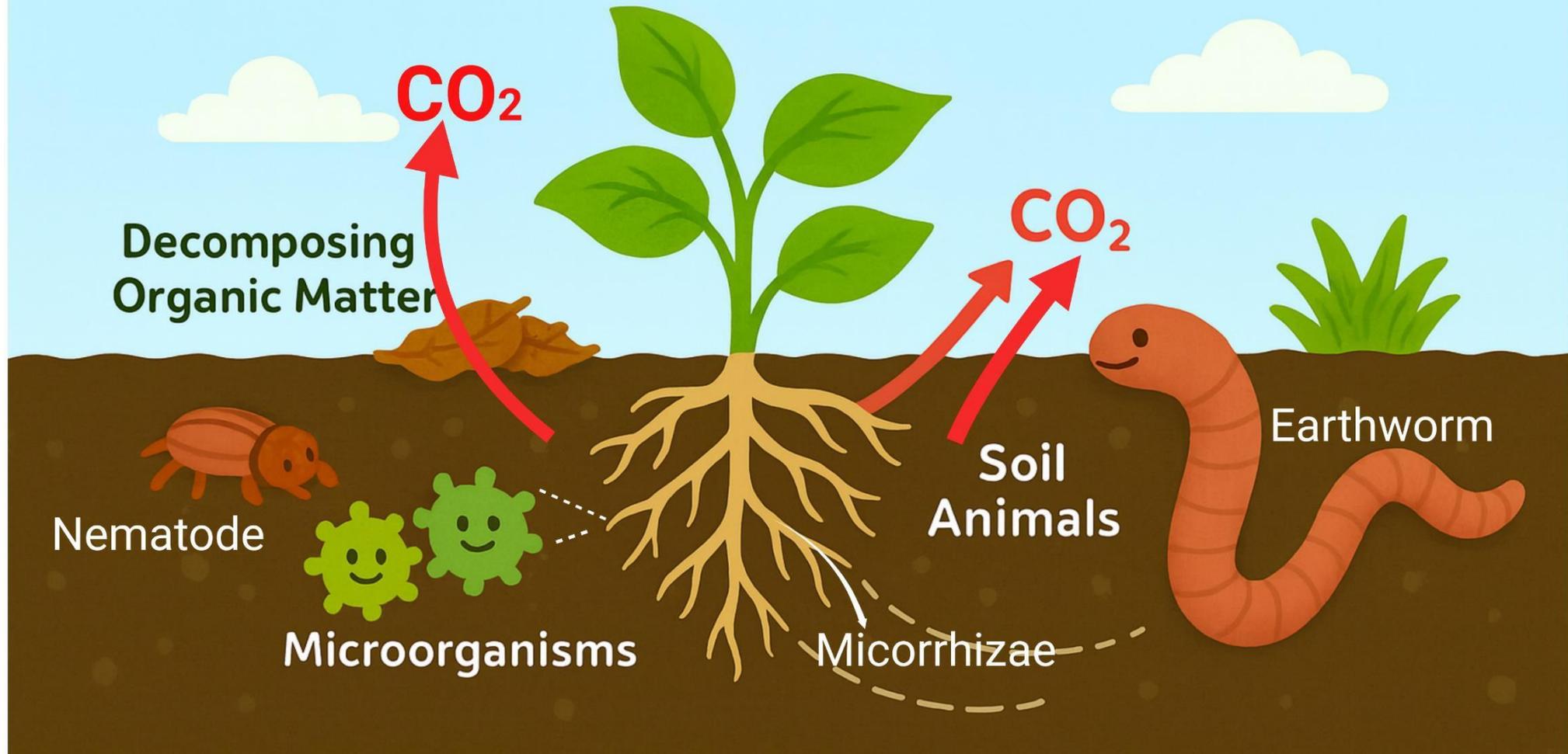


Carbon Cycle



What is soil respiration?

Soil respiration is the release of CO_2 from the soil, produced by plant roots, mycorrhizal fungi, microorganisms, and soil animals.



What can affect the soil respiration



Deforestation



Ploughing – agriculture



Mining



Forest fires

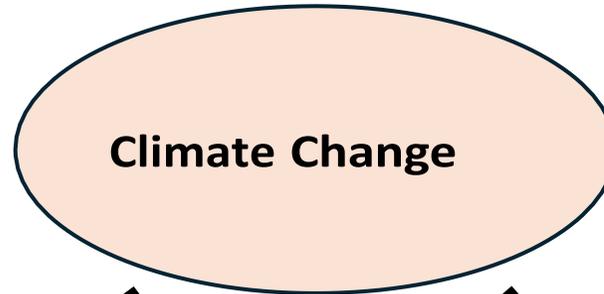


Peat mining for biomass



Peatland ditching

Permafrost thawing



Climate Change

Flooding



Desertification



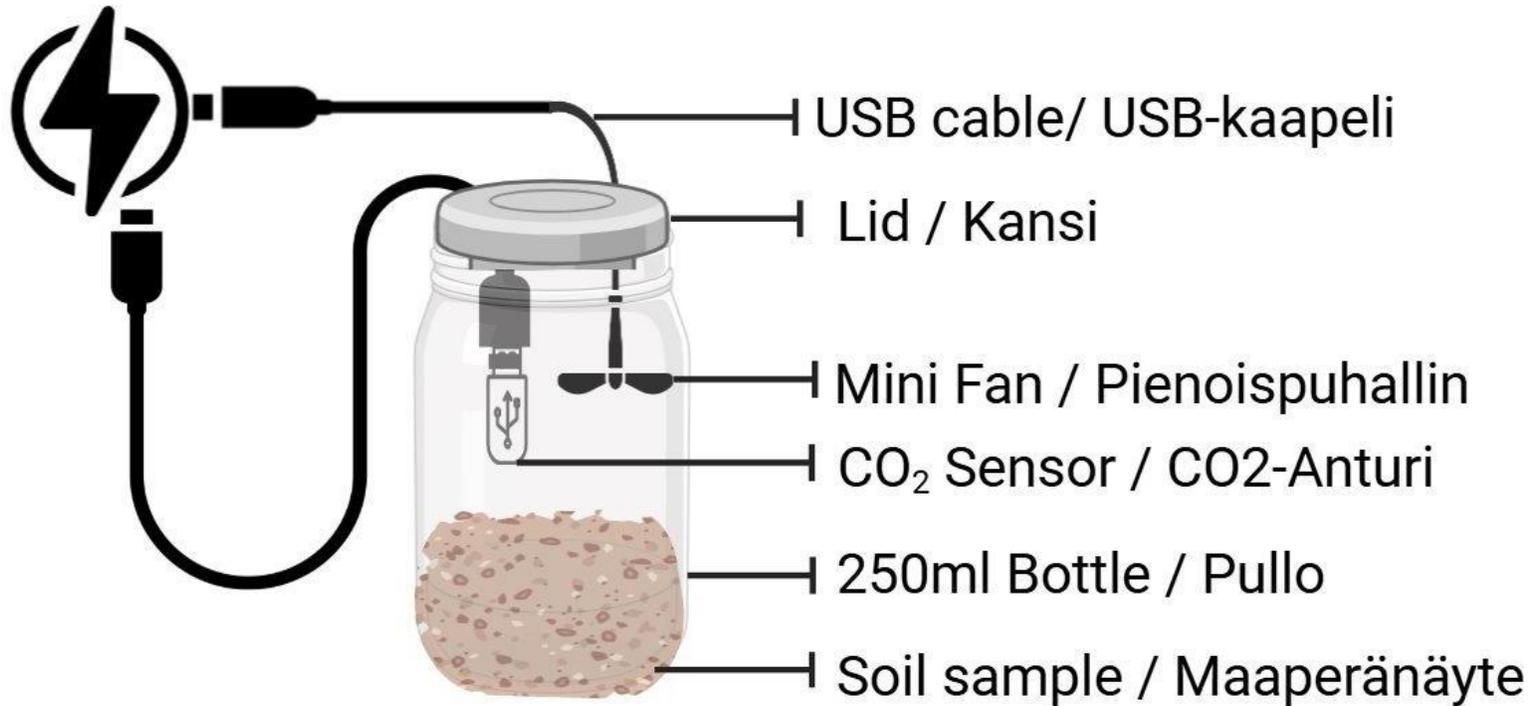
Soil erosion



Terrestrial Greening – longer growing season



How to measure soil respiration ?



5 minutes



How to calculate soil respiration ?



❖ **Example:**

**50 g soil in
250ml bottle**

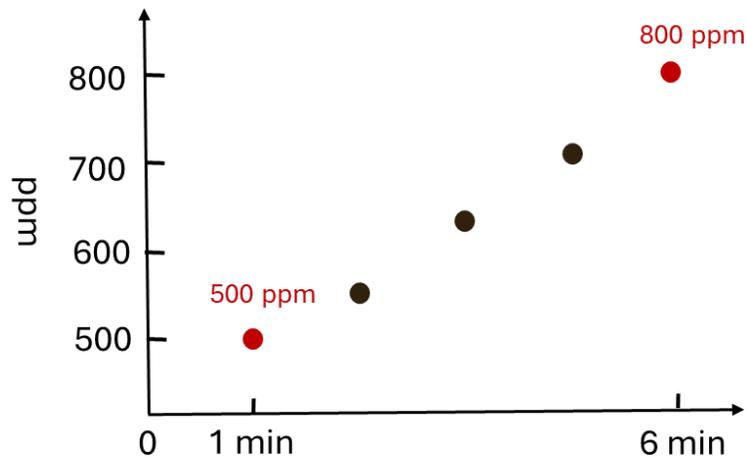


Figure 1. The change of CO₂ (ppm) in 5 mins

1. How many CO₂ produce in **1 minute**

$$(800 - 500) \text{ ppm} \div 5 \text{ mins} = 60 \text{ ppm/min}$$

2. Transfer CO₂ from **ppm** to **µg** in 250 ml bottle

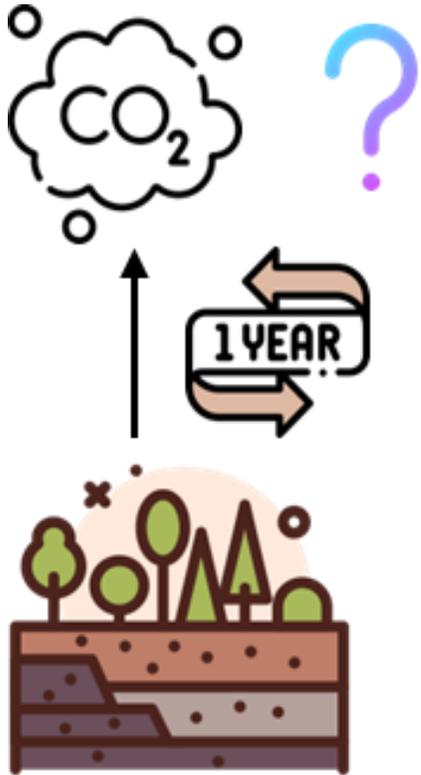
$$60 \text{ ppm/min} \times 0.45 = 27 \text{ µg / min}$$

3. How many CO₂ produce by **1 g soil** in 1 minute

$$27 \text{ µg / min} \div 50 \text{ g} = 0.54 \text{ µg CO}_2 \text{ / min / g soil}$$



Exercise



1 ha forest

How many
CO₂
produced
by **1 hectare**
forest soil in
one year in
Finland ?



1. Around **500,000,000 g** of organic soil in **per hectare boreal forest**.
2. 1 year = **525,600 mins**