

Carbon Activity 4 – The Case of Missing Carbon

In this activity, your students will:

- Learn how trees influence carbon cycle at the global level.
- See how the CO₂ concentration and vegetation cycles are monitored by satellites.

This activity is recommended for students over 12 years.

Basic information

Forests are a living pump. They exchange carbon between air, plants, animals and soil, and keep its amount in balance.

While it is impossible to measure influence of your tree on carbon in the air around, it is clear that trees of the northern hemisphere influence carbon cycle of the whole planet. This is visible in the graphs that display CO₂ concentration (Y axis) in Earth's middle troposphere over the seasonal cycle of vegetation (years on X axis).

The “rising arm” of the zig-zag shows the periods when respiration exceeds photosynthesis (autumn-winter). In other words, the biosphere releases more CO₂ to the atmosphere than absorbs.

The “falling arm” of the zig-zag shows the periods when photosynthesis exceeds respiration (spring-summer). In other words, the biosphere takes up more CO₂ than releases.

This pattern corresponds with the “green wave” in vegetation of the northern hemisphere, when plants and trees wake up and start to grow fast after the winter sleep.

The Case of Missing Carbon Activity

- Play your students an animation [“Watching the Earth Breathe”](#).
- Explain that the video shows changes in CO₂ concentration (yellow-orange layer) and vegetation cycles captured by satellites.
- Pause video at 0:02 (end of March), 0:07 (end of August) and 0:10 (end of November) and let students guess what month it is.
- You can also watch an animation [“How Much Carbon do Plants Take from the Atmosphere?”](#) to see, how much carbon is removed from atmosphere by plants at different times and places.

