

Activity 2 – Look at the Buds

1) On a south facing branch of your tree mark 4 buds:

- If possible, choose a south facing branch
- always start from the end of the branch
- use permanent marker or tape
- take a picture of all 4 buds



2) Observe the buds twice a week:

- For each bud, record at what stage it is:
 - “dormant” if the bud is unchanged.
 - “swelling” if the bud is getting bigger.
 - “budburst” the first day you see the green tips of leaves.
 - “lost” if the bud or leaf gets lost or damaged.

Tree and Shrub Green-Up					
Date (day & month)	Leaf 1 (dormant, swelling, budburst, leaf length (mm))	Leaf 2 (dormant, swelling, budburst, leaf length (mm))	Leaf 3 (dormant, swelling, budburst, leaf length (mm))	Leaf 4 (dormant, swelling, budburst, leaf length (mm))	Data entry ✓

- When you see that the bud is swelling, observe it every day, so that you do not miss the date of budburst
- Share the date of budburst at the [Discussion forum](#).
- Do not forget to continue taking pictures of your tree using [GrowApp](#)
- After the bud opens, continue to measure the length of the leaf (this will be the Activity 3)

3) Optional: Record temperature and precipitation

If you have an Atmosphere site nearby, keep recording temperature and precipitation data along with observing the buds and see if there is any link.

- 🕒 **The activity should be completed by April 17th (or after the budburst 😊)**
- 🗣️ **Share your picture and the date of budburst at the [Discussion forum](#).**
- 🌿 **TIP: Students can take turns observing a tree near the school or observe their own trees. Use tools such as [Padlet](#) or [Wakelet](#) to share pictures and results.**



Green-up

Tree and Shrub Green-Up Data Sheet

School Name: _____ Study Site: _____

Observer Names: _____

Plant Scientific Name: Genus _____ Species: _____

Plant Common Name: _____

Green-Up Cycle: _____ Year: _____

Tree and Shrub Green-Up					
Date (day & month)	Leaf 1 (dormant, swelling, budburst, leaf length (mm))	Leaf 2 (dormant, swelling, budburst, leaf length (mm))	Leaf 3 (dormant, swelling, budburst, leaf length (mm))	Leaf 4 (dormant, swelling, budburst, leaf length (mm))	Data entry ✓

Check the last column in the green-up table to keep track of data submitted.

Comments (date each comment): _____

Carbon Activity 2 – Carbon Around Me

Your students already know that trees need carbon to build their body. In the 2nd carbon activity they will:

- Learn about the existence of the carbon cycle and its main parts.
- Discuss, what carbon pools and fluxes (flows) can be found in your area.
- Think about local sources of carbon.

Basic information

Carbon is the basic building block of life. Carbon atoms are found everywhere on Earth. Carbon accounts for 45-50% of the total mass of the biosphere and is also stored in the ocean, the atmosphere, and the crust of the planet. A carbon atom could spend millions of years moving through Earth in a complex cycle.

The global carbon cycle characterizes the movement of carbon between Earth's spheres. It is a key regulator of Earth's climate system and is central to ecosystem function.

Carbon Around Me Activity

- Watch an animation that provides an illustration of the various parts of the Carbon cycle: <https://svs.gsfc.nasa.gov/10494> (created by NASA/Goddard Space Flight Center/UMBC). In the animation, purple arrows indicate the uptake of Carbon; yellow arrows indicate the release of Carbon.
- Let your students think and discuss about carbon release and uptake of carbon in your surroundings. Are there any major sources of carbon? Are there any pools?
- Create a carbon map of your neighborhood based on the results of your discussion. You can use the map from the next page or create your own.
 - Use a different color for uptake and for release flows.
 - Add a legend on the map.
 Share the map on the [Discussion forum](#).



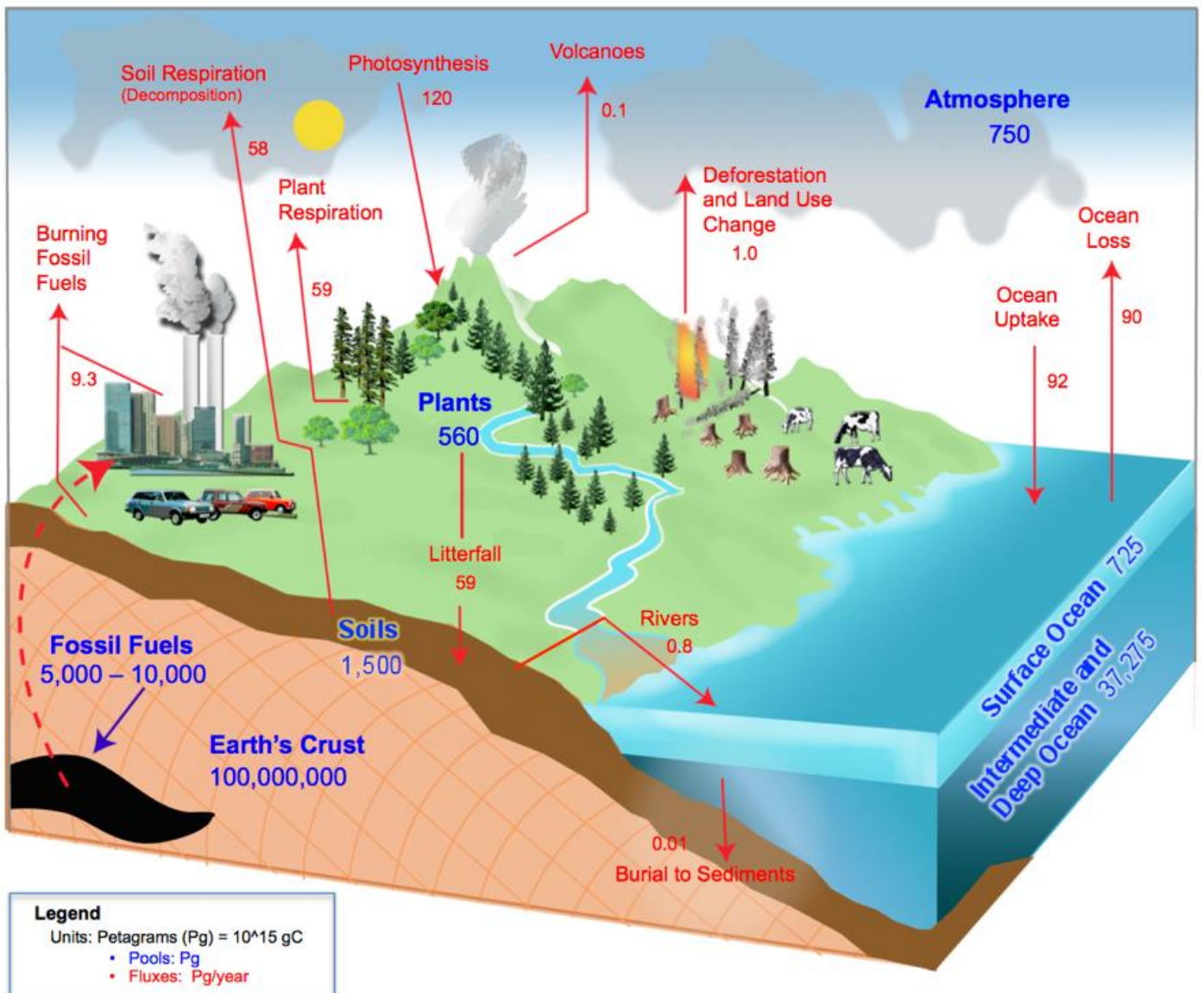
Optional

- Think about your role in the carbon cycle. Which of your activities contribute to the carbon production?
- With older students do research about carbon cycle sources and storage in your neighborhood.

 **TIP: Create an online activity book with a map and results of your exploration using [Book Creator](#) or another online tool.**

 **Share the result on the campaign [discussion forum](#).**

Global Carbon Cycle Diagram



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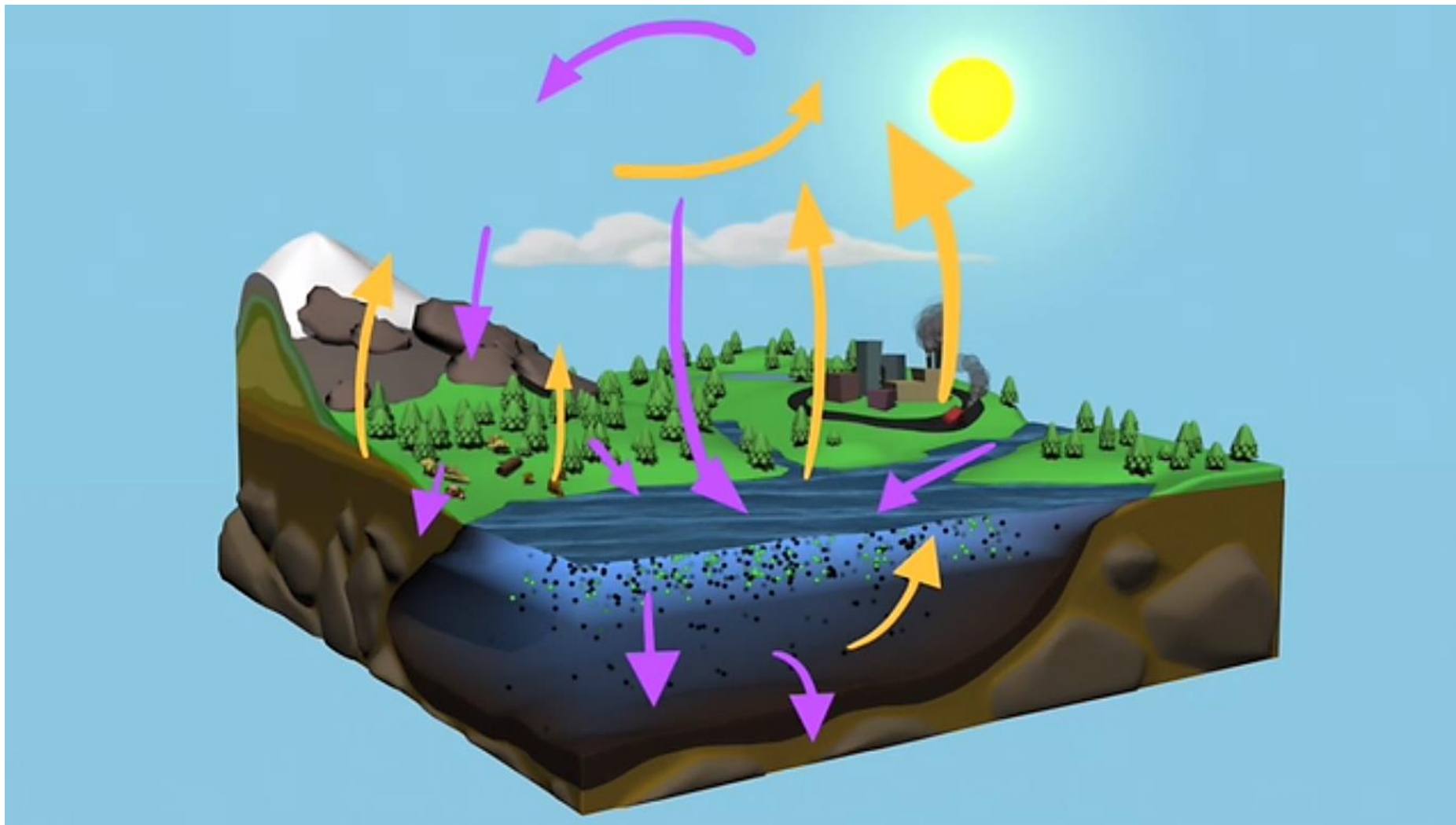
Global Carbon Cycle Diagram

Biosphere

Data Sources: Adapted from Houghton, R.A. Balancing the Global Carbon Budget. Annu. Rev. Earth Planet. Sci. 007.35:313-347, updated emissions values are from the Global Carbon Project: Carbon Budget 2017. Diagram created by a collaboration between UNH, Charles University and the GLOBE Program.

Carbon Pools: A place where carbon resides, measured in Petagrams

Carbon Fluxes: Movement of carbon between pools, measured in Petagrams/year



Source: NASA/Goddard Space Flight Center/UMBC