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 10th.

To earn a Collaboration badge, share the date of budburst

Students can take turns observing a tree near the school or observe their own trees. Use online tools such as Padlet or Wakelet to share pictures and results in your team.

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.

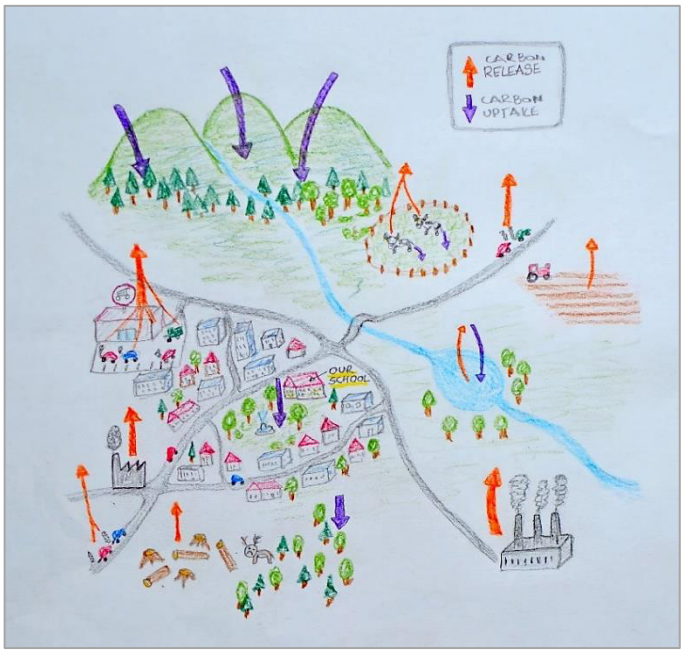
Carbon Around Me Activity

- 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.

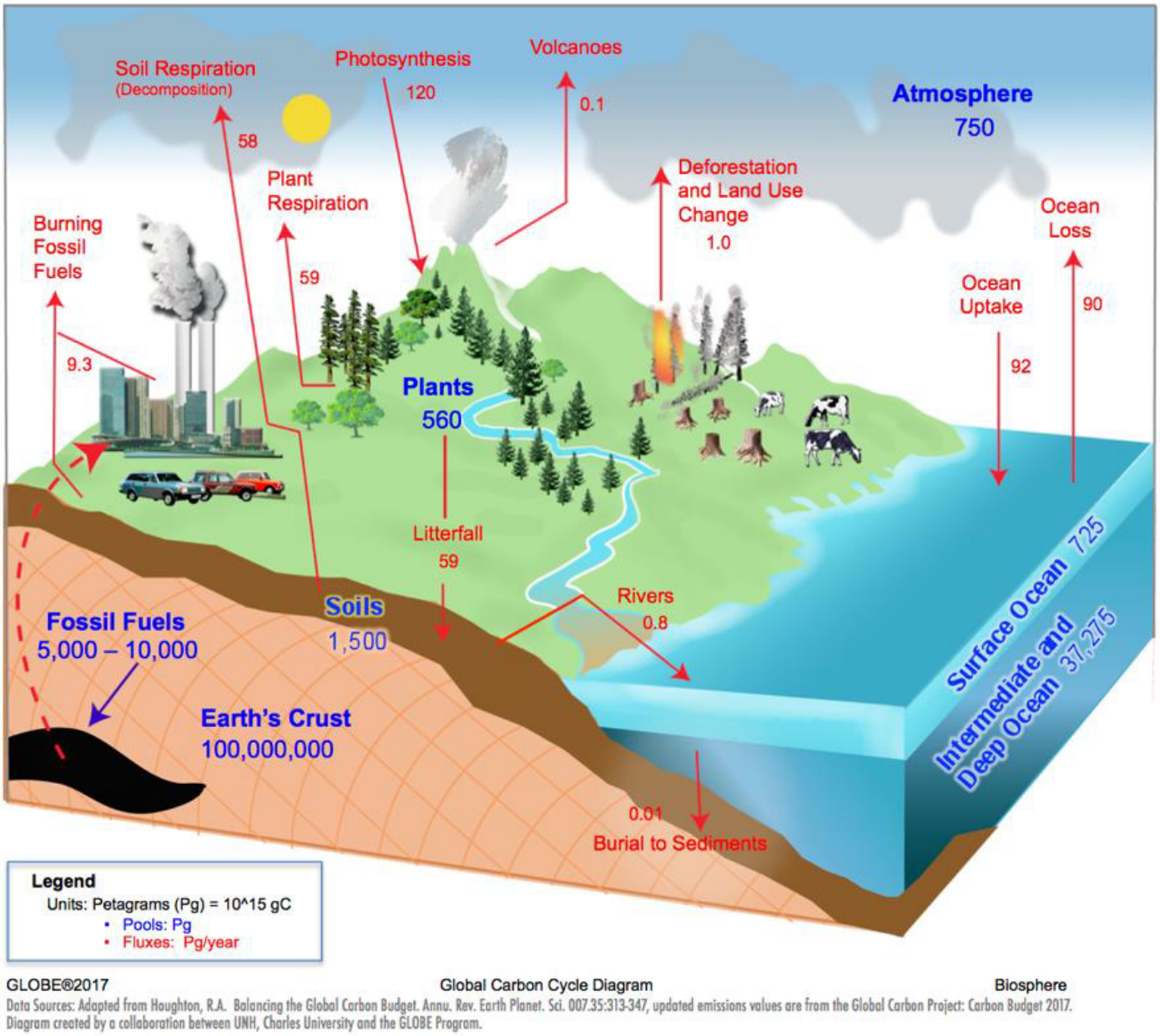
Optional

- 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.



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

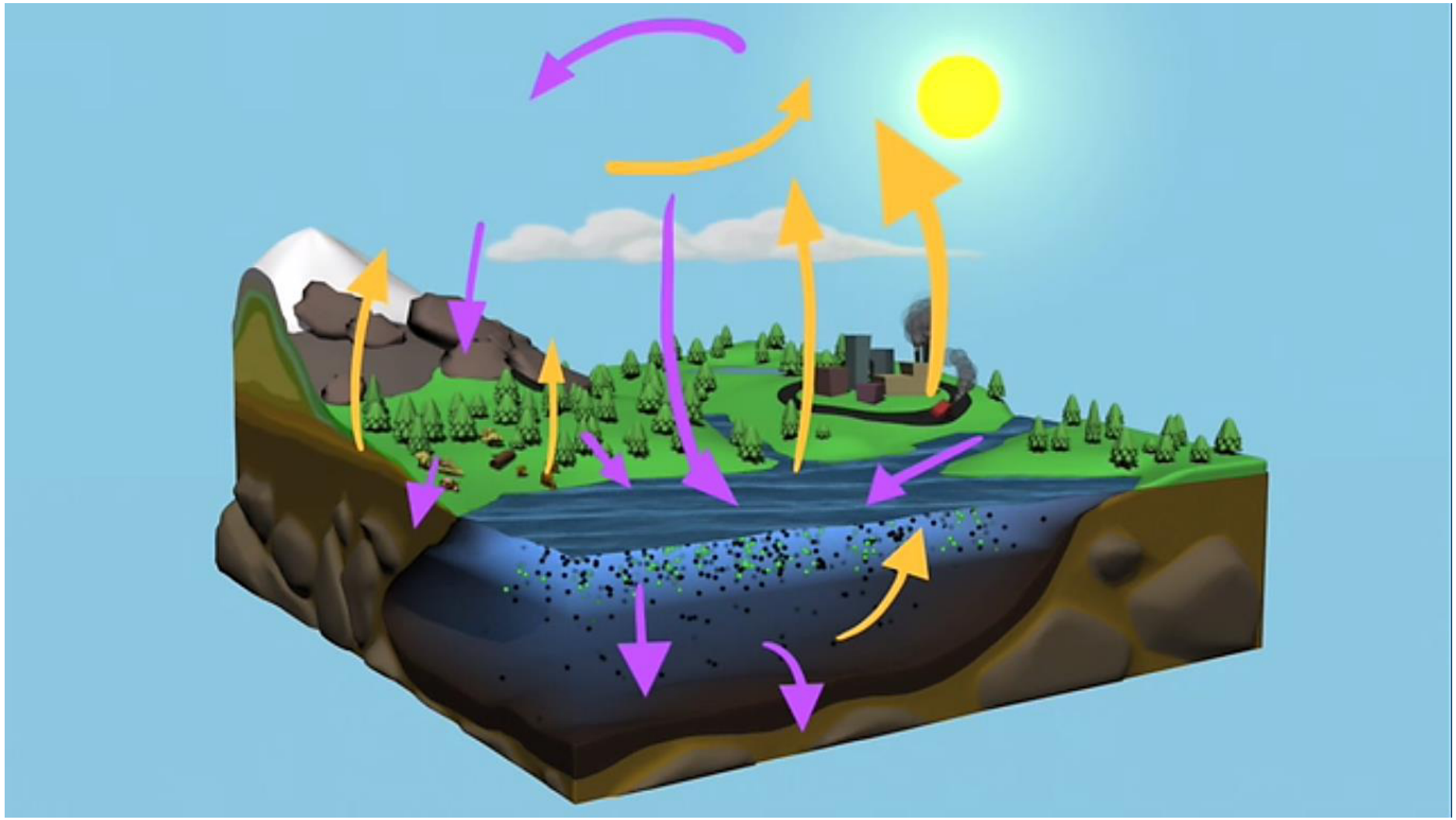


GLOBE®2017 Global Carbon Cycle Diagram Biosphere

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