

SW CARES

Youth Education: Carbon & Stormwater



Jefferson County SWCD

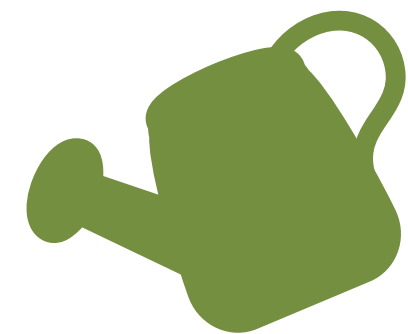
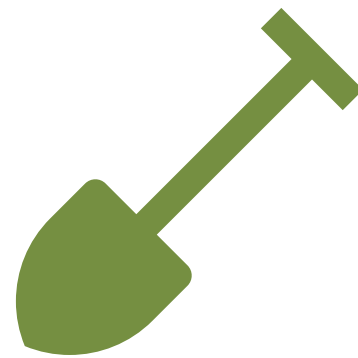
Sarah Trick



SW CARES

Storm Water, Carbon Awareness, and
Reforestation Education for Students

Teaches 4th graders in and out of the
classroom, incorporating hands-on
learning to reinforce both new and
review concepts



Goals

- Introduce students to new concepts: stormwater, carbon sequestration, and reforestation
- Support MS4 communities in their public outreach requirements
- Demonstrate how actions impact the environment



Program Reach

LAUNCHED in 2022

2 classrooms at Mannsville
Elementary

EXPANDED in 2023

15 classes at 5 elementary
schools: 297 students!!

Focused on reaching students
in MS4 communities!



About the Program



Classroom Learning
Students spend one hour in the classroom with an interactive lesson taught by District staff



Real-World Experience
Students get outside to see storm drains around their school as well as how to properly site and plant a tree



Take Action
Students are given their own trees to plant as well as a goodie bag with information on District programs and other literature

Classroom Lesson

Review concepts of photosynthesis and the water cycle

- Remind students that plants use carbon to create food

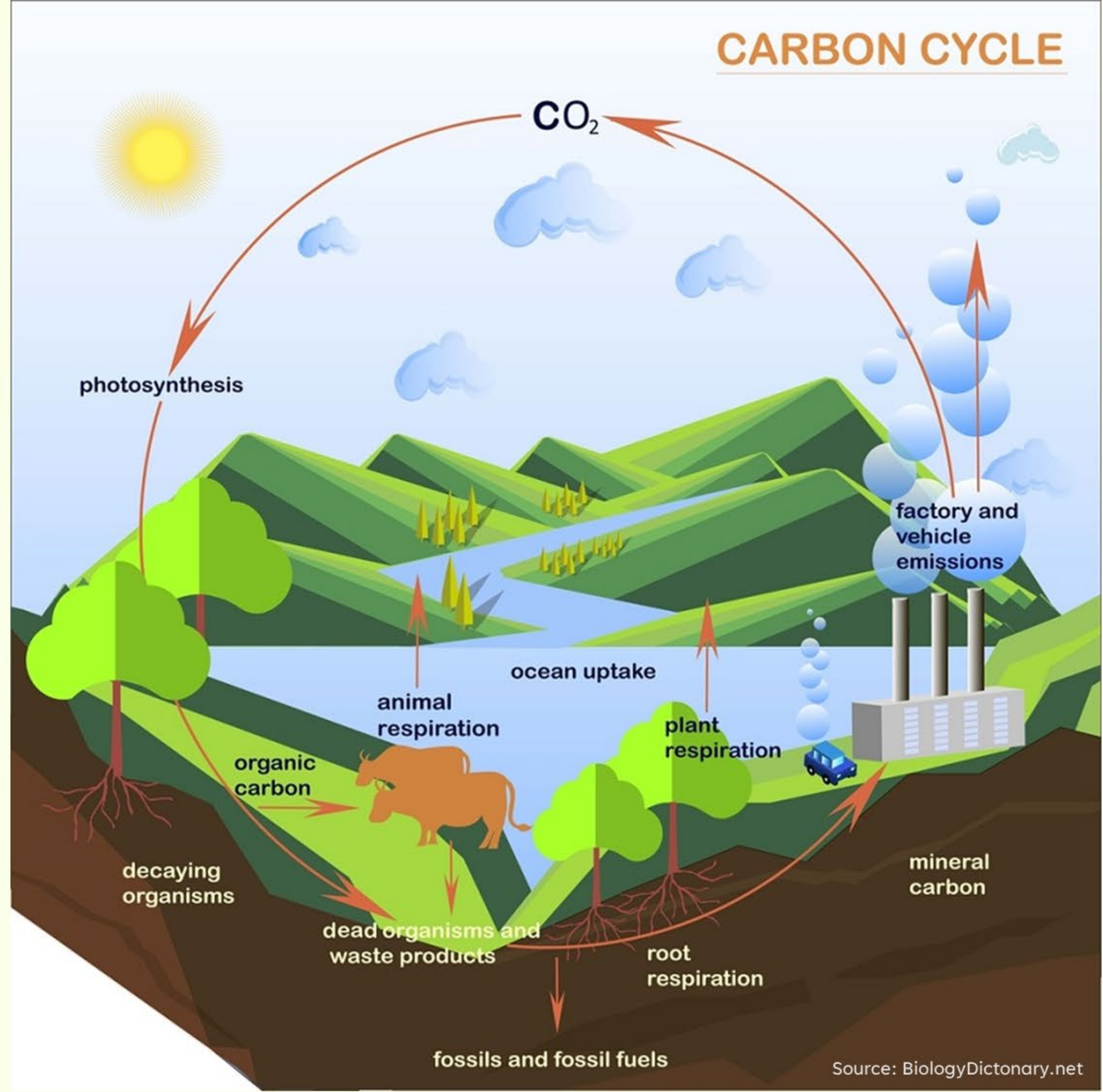
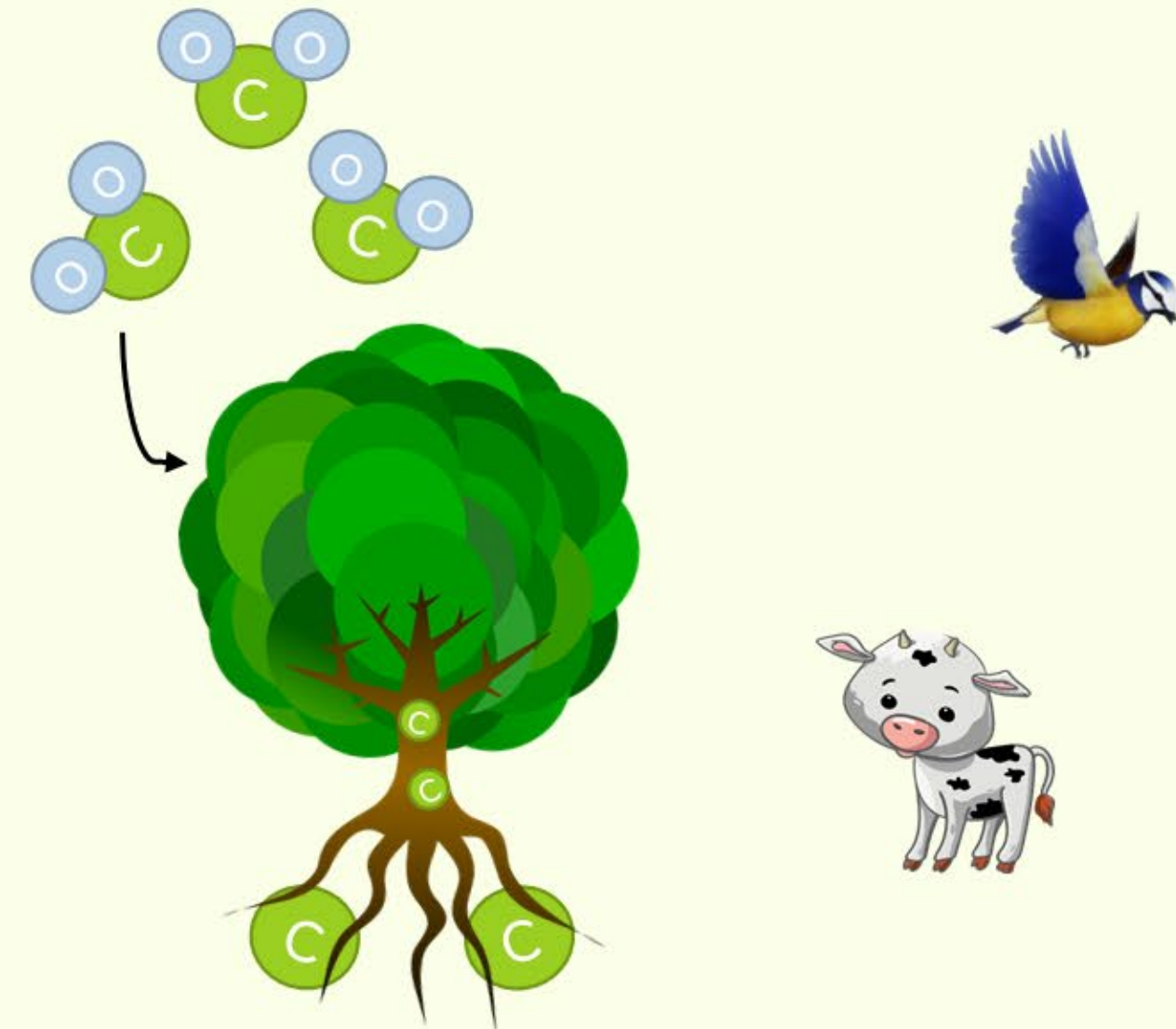
Discuss carbon and the carbon cycle

- Stress sequestration and the storage of carbon in soil and plant tissues



THE CARBON CYCLE

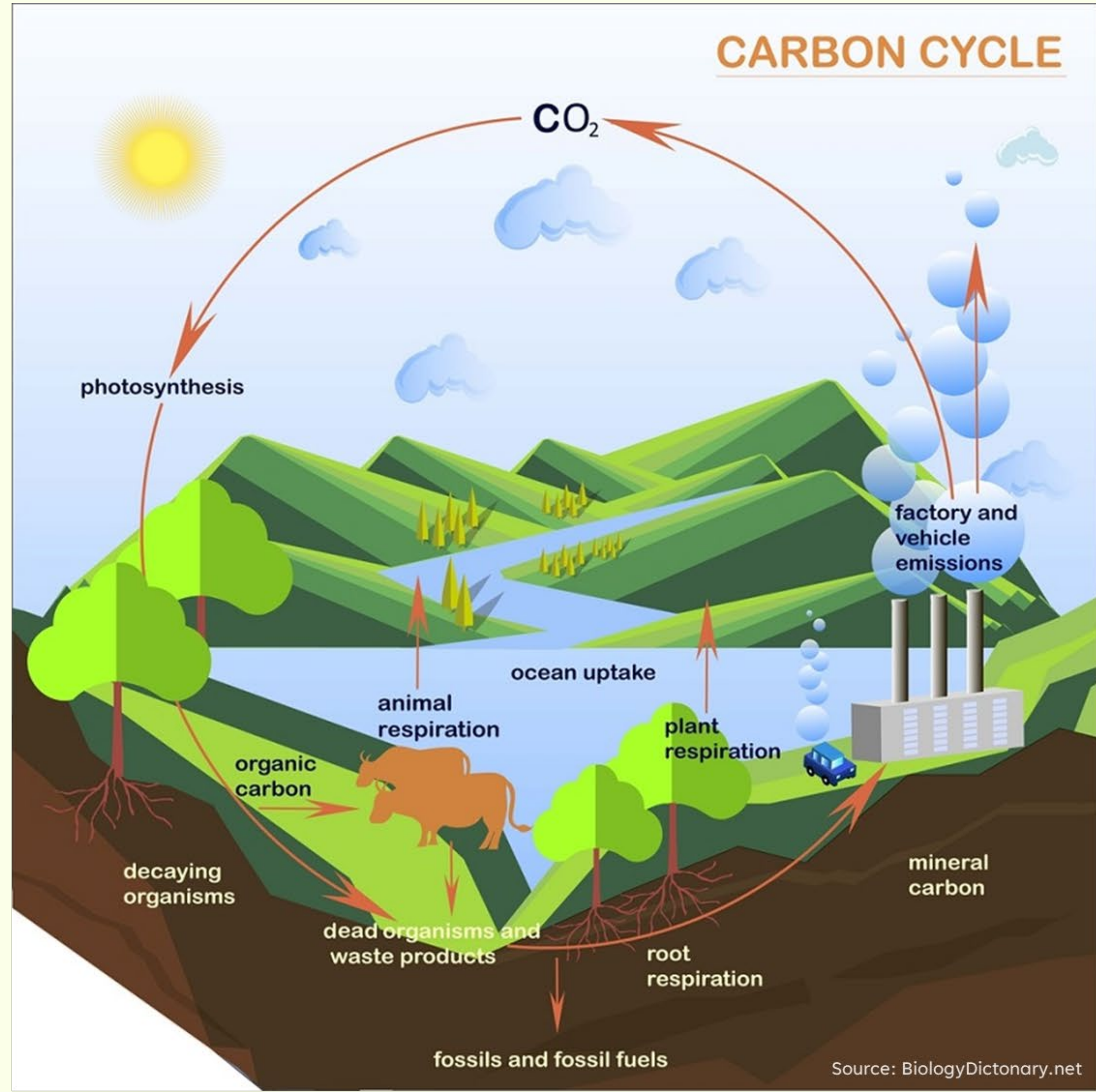
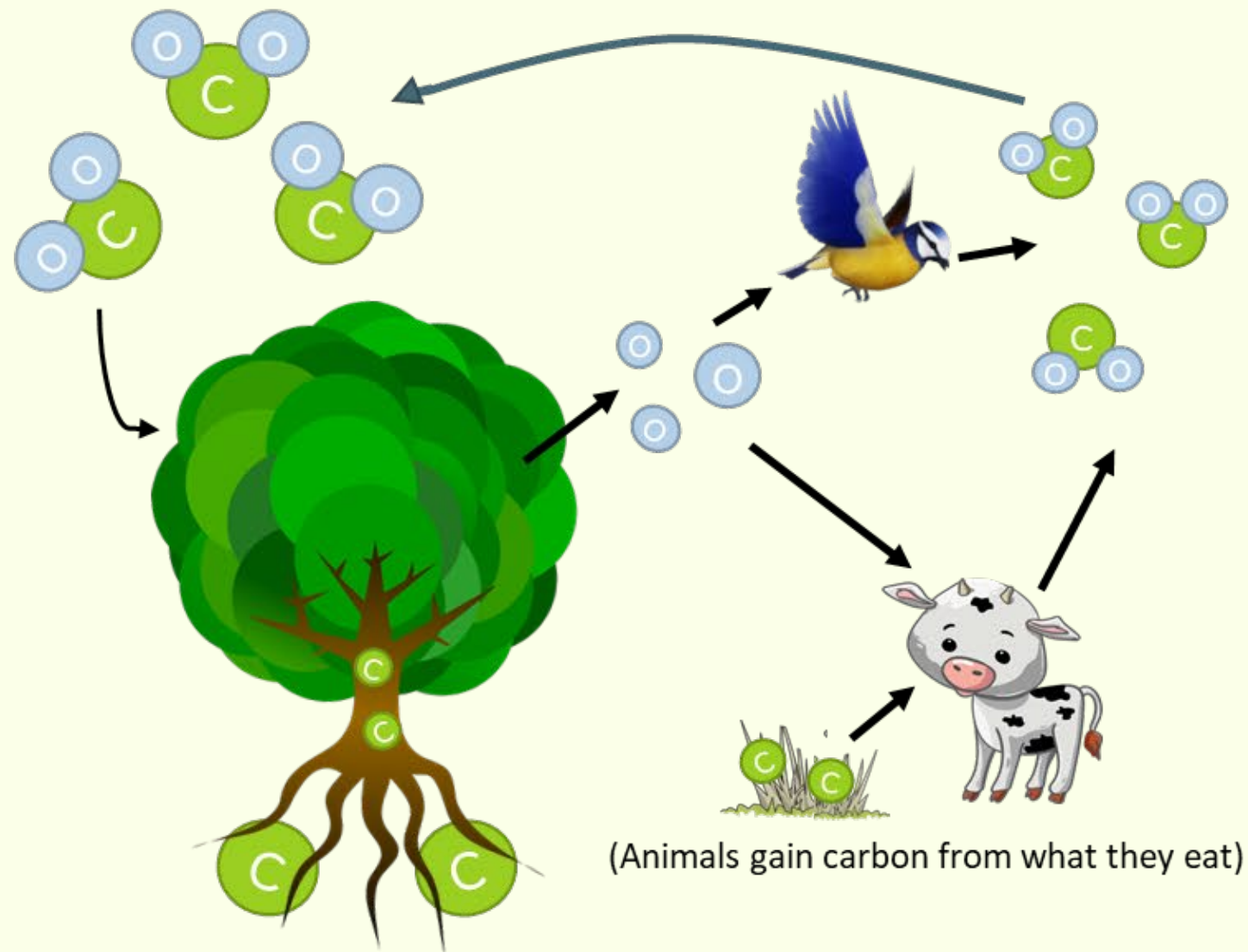
1. Carbon Dioxide in the atmosphere is taken up by plants
2. Plants on land and in water sequester (remove) this carbon from the air



THE CARBON CYCLE

3. Plants then release oxygen as a waste product and animals breathe it in.

4. Animals breathe out Carbon Dioxide
And the cycle starts again!



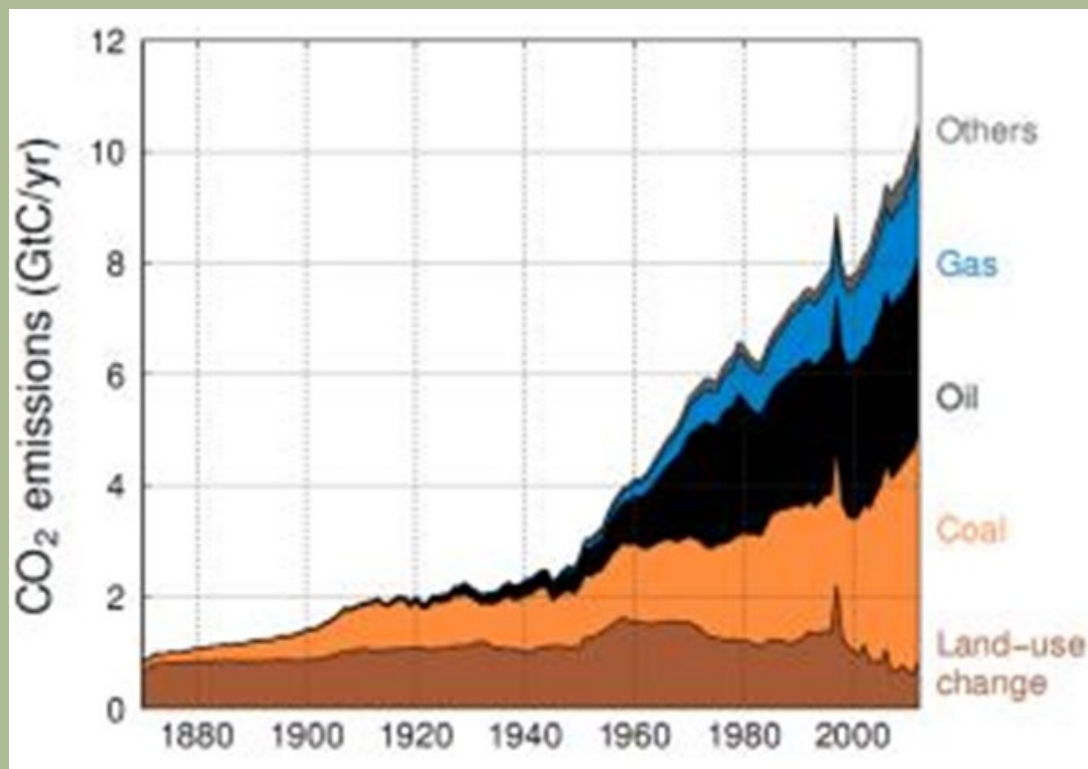
Classroom Lesson

Discuss how the carbon cycle is out of balance and its impact

- Industrial Revolution and fossil fuels

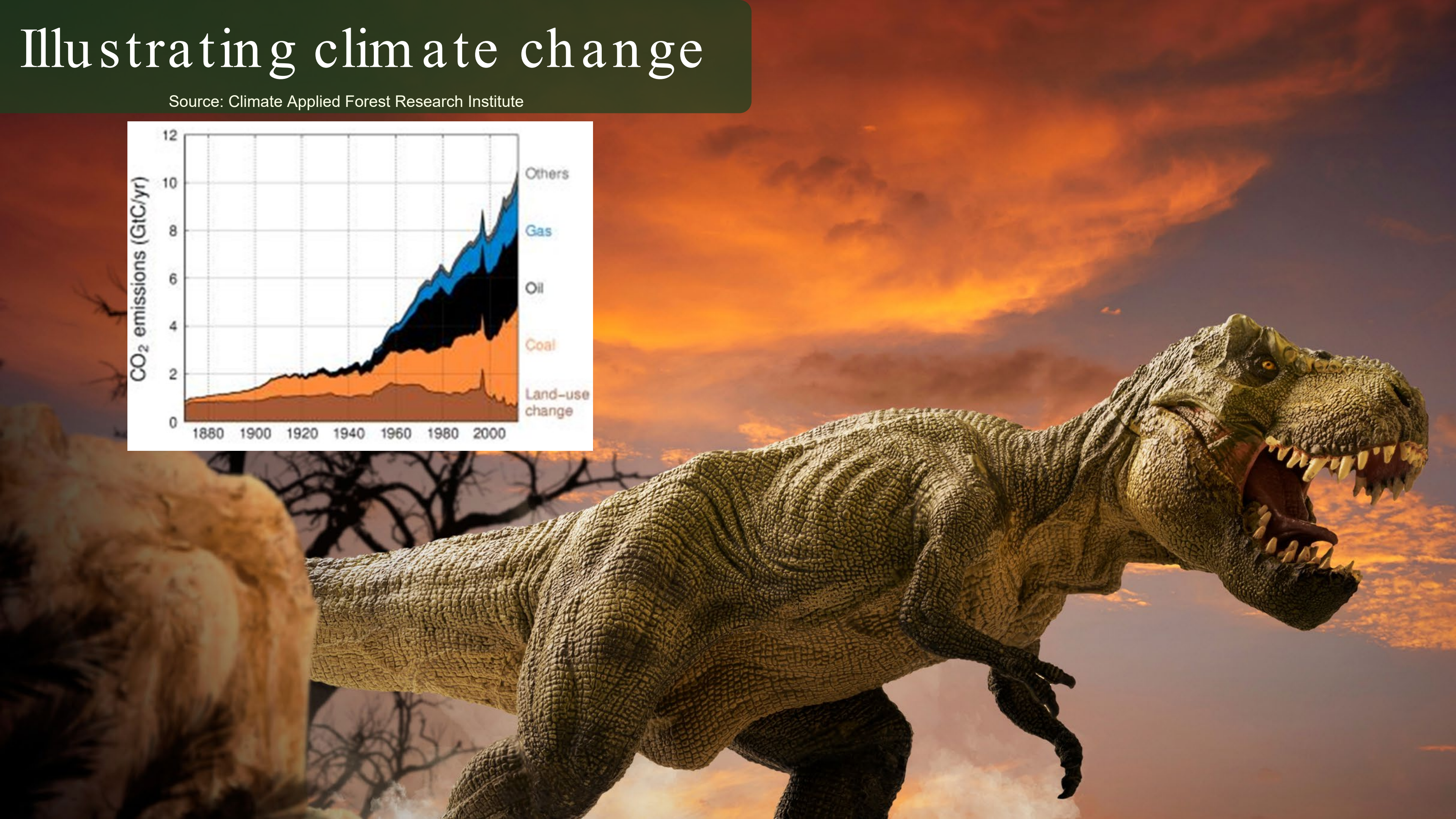
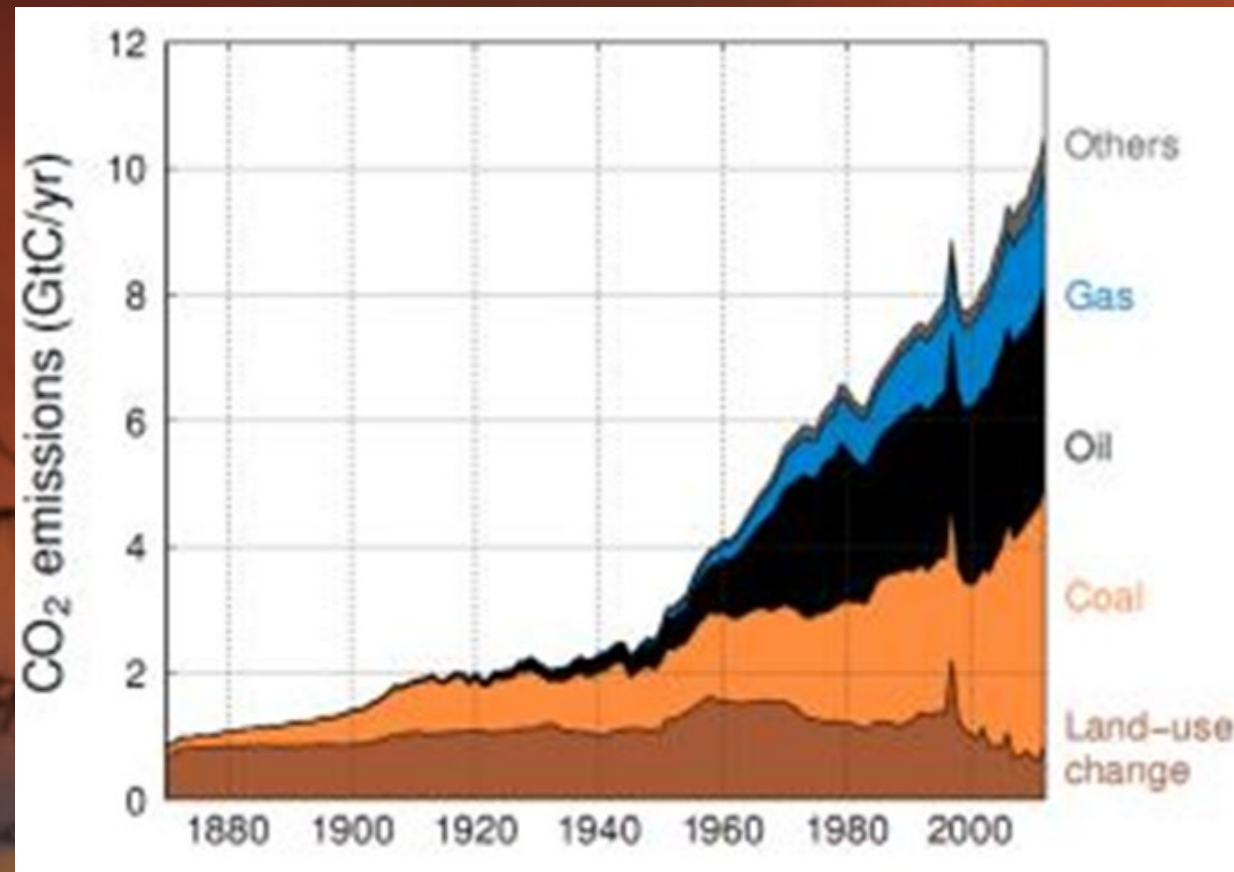
Explain greenhouse gasses and how they work

Source: Climate Applied Forest Research Institute



Illustrating climate change

Source: Climate Applied Forest Research Institute

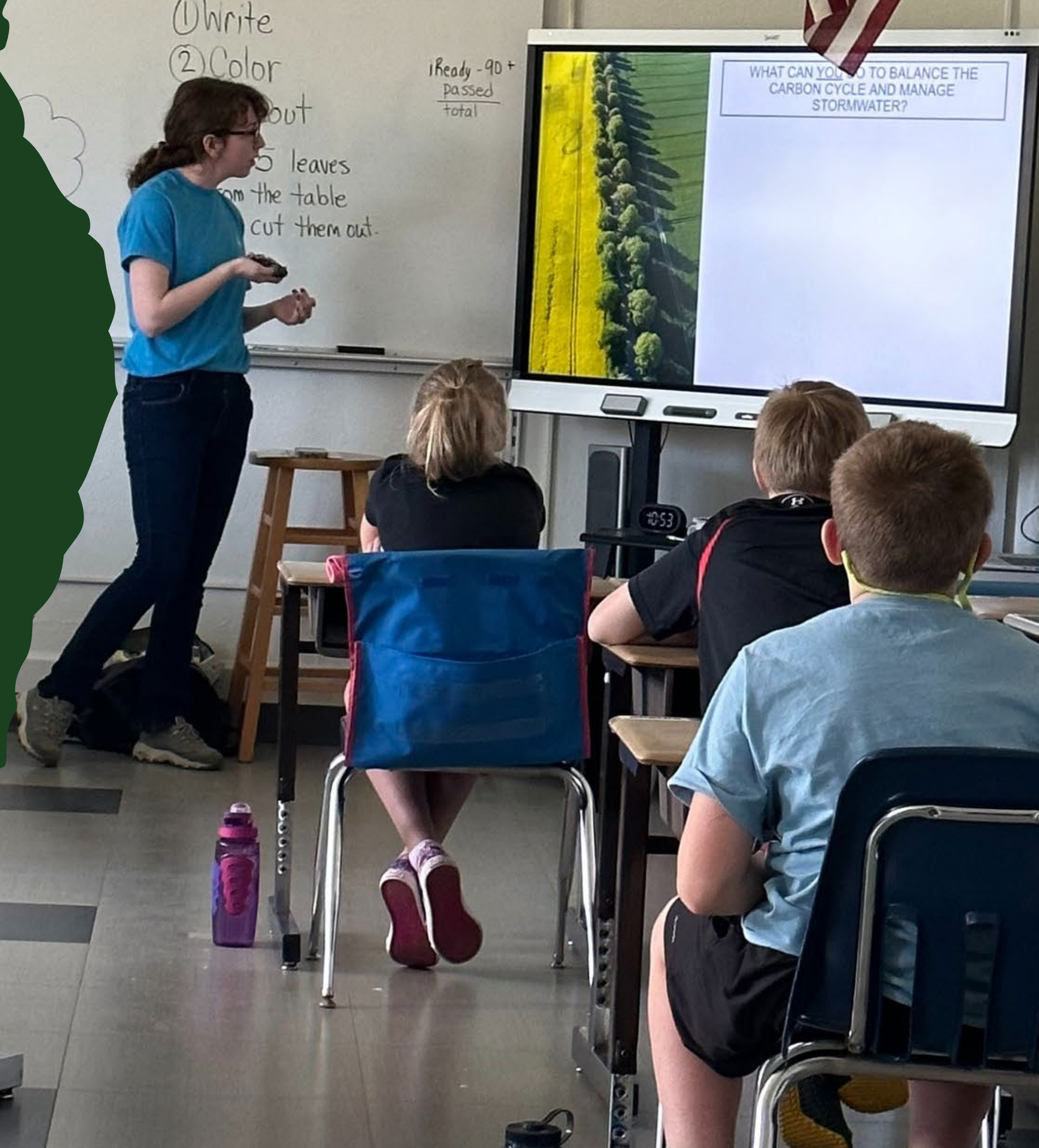


Greenhouse Gas Emissions

Positive and negative effects of greenhouse gasses

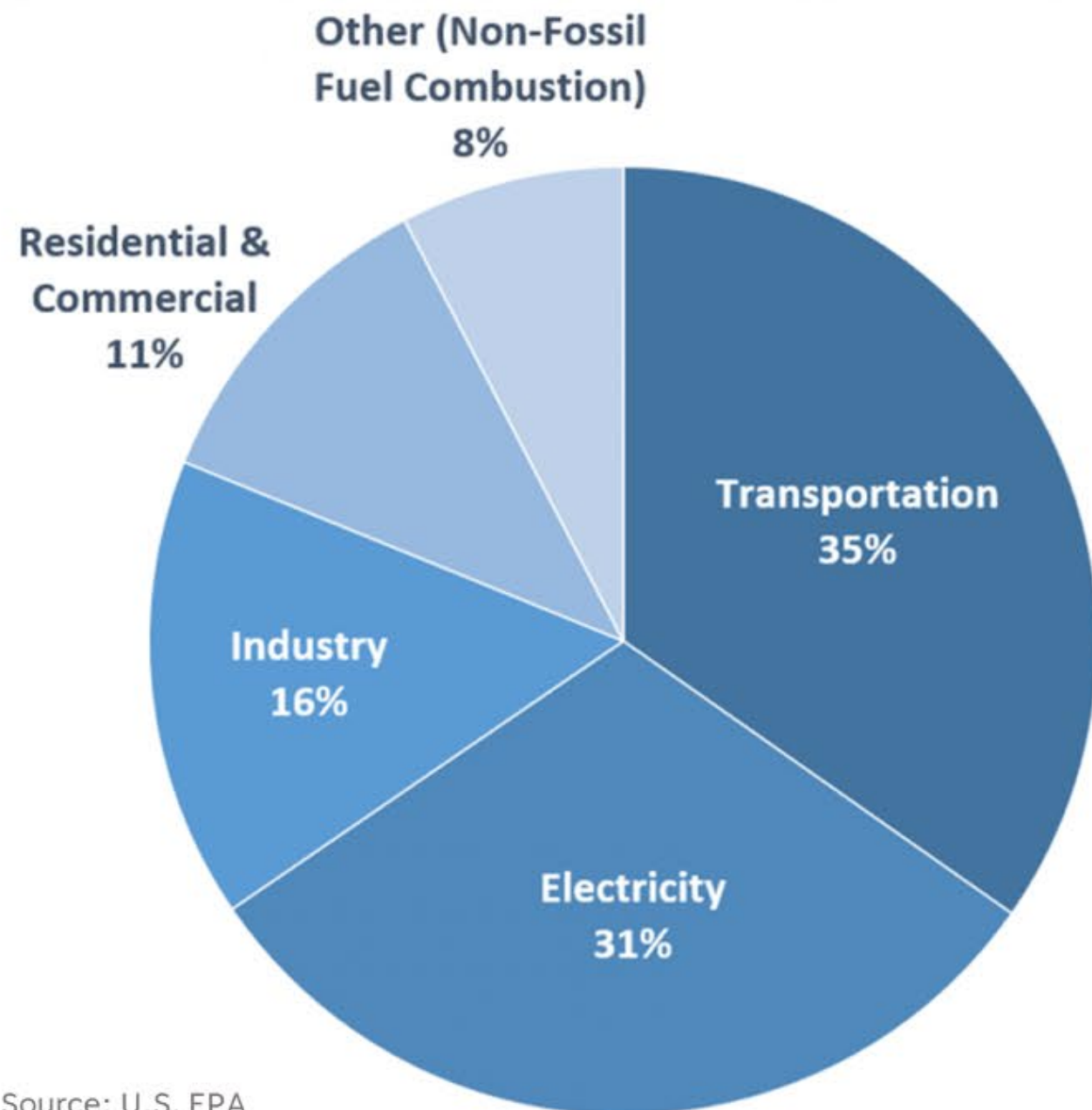
- We can't survive without them, but balance is needed

U.S. carbon emissions by source and the sacrifices we'd have to make to cut emissions completely



BUT CAN WE STOP BURNING FUEL? WHAT ARE SOME ALTERNATIVES?

2019 U.S. Carbon Dioxide Emissions, By Source



Source: U.S. EPA



STORMWATER MANAGEMENT

What is Stormwater?

Surface water in abnormal quantity resulting from heavy rainfalls or snow/snow melt.

This becomes a problem when there's
too much water for the ground to absorb
or
the **ground has been covered by**
pavement or buildings

And this isn't just a city issue...



Storm water

Watersheds

- Discuss where their drinking water comes from

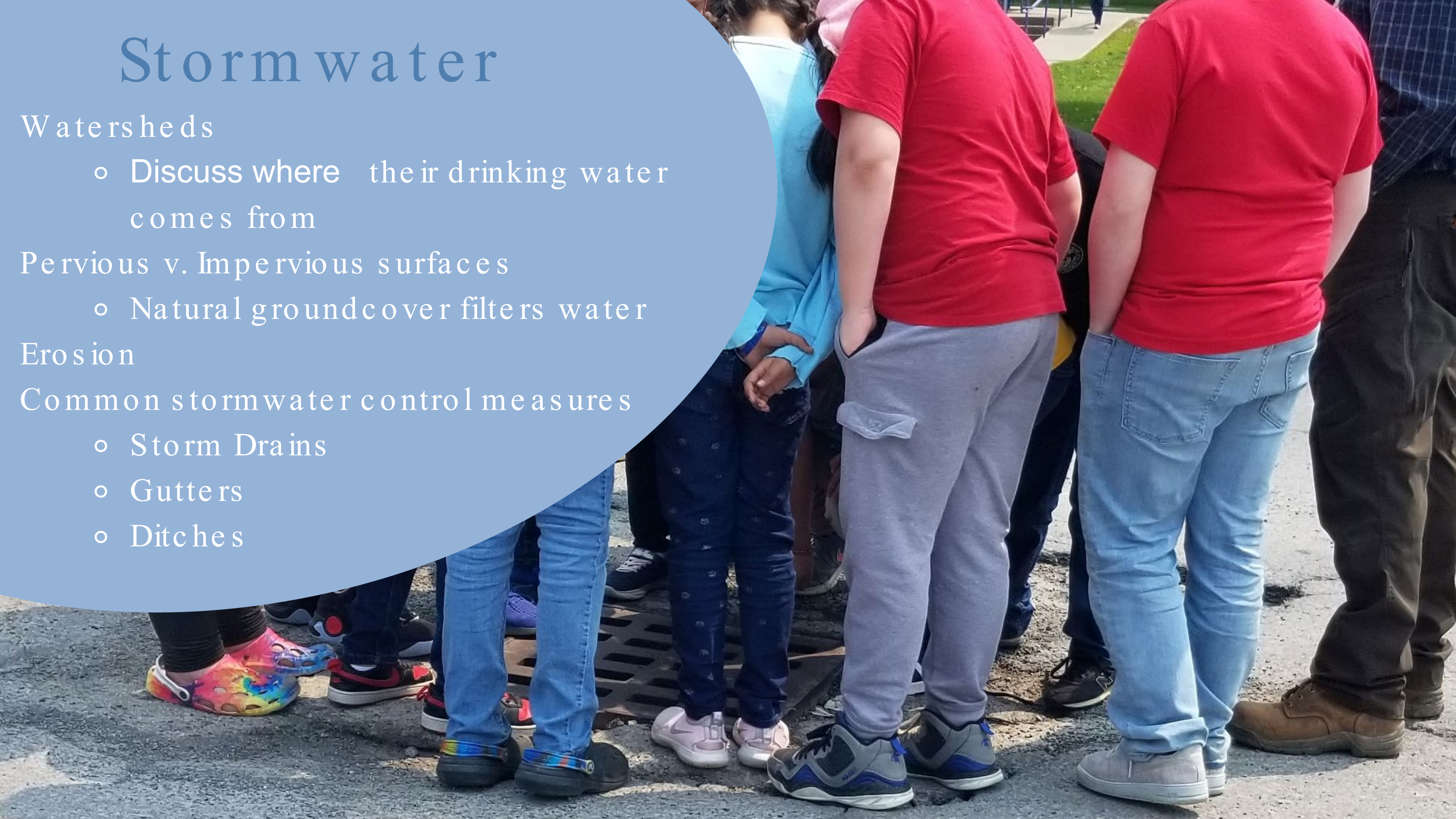
Pervious v. Impervious surfaces

- Natural groundcover filters water

Erosion

Common stormwater control measures

- Storm Drains
- Gutters
- Ditches







WHAT CAN YOU DO TO BALANCE THE CARBON
CYCLE AND MANAGE STORM WATER?

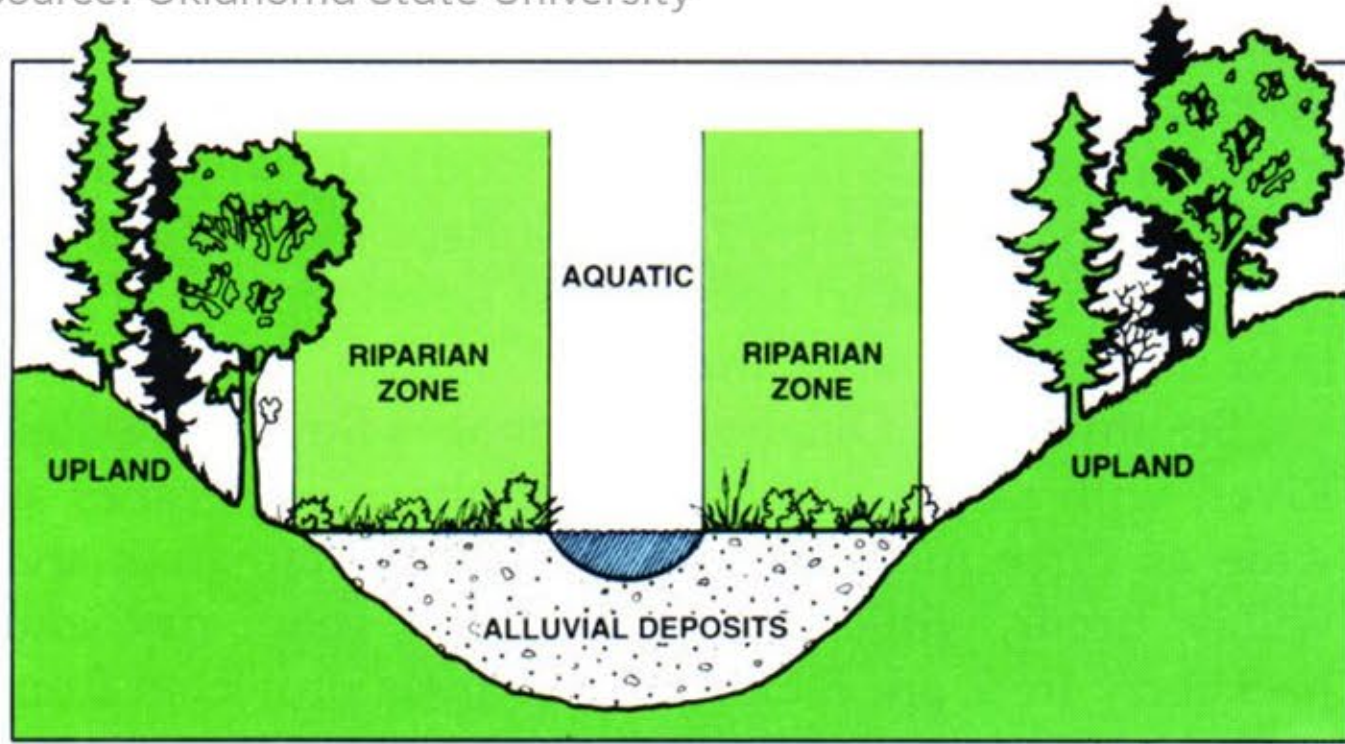


WHAT CAN YOU DO TO BALANCE THE CARBON
CYCLE AND MANAGE STORM WATER?

Our answer:

PLANT TREES!

Source: Oklahoma State University



RIPARIAN FOREST BUFFERS

Streamside

Trees

Protective Strip

Riparian buffers are made up of trees and shrubs along a stream, creek, or river that naturally **filter** and **slow** the rate of water entering a waterbody

[Video](#)

THESE BUFFERS PROVIDE MANY BENEFITS

- Natural filter to purify water
- Reduces erosion
- Stabilizes streambanks
- Provides shade and temperature control for stream water
(many coldblooded animals live in streams and warm water holds less oxygen than cold)
- Flowering plants support pollinators
- Protects and provides habitat for aquatic and land animals

A close-up, slow-motion photograph of rain falling onto a wet, reflective surface. The raindrops are captured mid-fall, creating a dense pattern of white streaks against a dark, blurred background. The foreground shows a wet surface with many small, shimmering droplets and ripples. A thin, light-colored rectangular border frames the central text.

CAN YOU SPOT THE BUFFER?



Source: Mississippi River Basin Conservation Network



Source: Manaaki Whenua Landcare Research







Source: Ontario Ministry of Agriculture, Food, and Rural Affairs



Source: WITF.org



Source: University of Nebraska

CONVENTIONAL DISKING

- Increased erosion (from wind and water)
- Kills beneficial microorganisms
- Leads to dryer soils in summer months when plants need groundwater
- Increased need for artificial fertilizer and herbicides
- Harder for plant roots to grow
- Releases carbon stored in soil

NO/ LOW TILL FARMING

- Better habitat for beneficial soil organisms
- Decreased Erosion
- Increased organic matter (More nutrients)
- Decreased need for fertilizer
- Less weeds (Decreased herbicide use)
- Increased infiltration (water absorbs into soil)



Source: Unverferth Farm Equipment

Afforestation and Reforestation

Discuss the meaning of prefixes to highlight the differences between the two words.

Provide examples of afforestation and reforestation.

Discuss planting their own trees!





OUTDOOR EDUCATION

Storm Water Control



Tree Planting





Jefferson County
Soil & Water Conservation District

Questions?

SW CARES

Sarah Trick

ERS@JeffersonCountySWCD.org

Stormwater Coalition

George Birth

ERS@JeffersonCountySWCD.org

(315) 782-2749



25451 State Route 12
Watertown NY 13601