UNIT 5: CHEMISTRY OF CLIMATE CHANGE

Workbook 5.2: Climate Change

Lesson 11: Getting Gassy

GUIDING QUESTION: WHAT IS THE ROLE OF NATURAL AND HUMAN COMMUNITIES IN THE PRODUCTION OF GREENHOUSE GASES?

- Do Now:

Are greenhouse gases good or bad? Explain and be prepared to defend your answer.

CORRECTION TO OUR NOTES

- Greenhouse Gas ***Source***:
  - Any process or activity that releases a greenhouse gas (GHG) into the atmosphere

- Greenhouse Gas ***Sink***:
  - A reservoir that absorbs or accumulates greenhouse gases (GHG)

WHAT ARE WE DOING?

- Getting Gassy (workbook pages 10-12)
  - Use pages 7-14 in reader to answer the questions regarding water vapor, carbon dioxide, methane, and nitrous oxide on pages 10-11.
  - Use your phone to research other greenhouse gases for page 12.

NOTES

Water Vapor

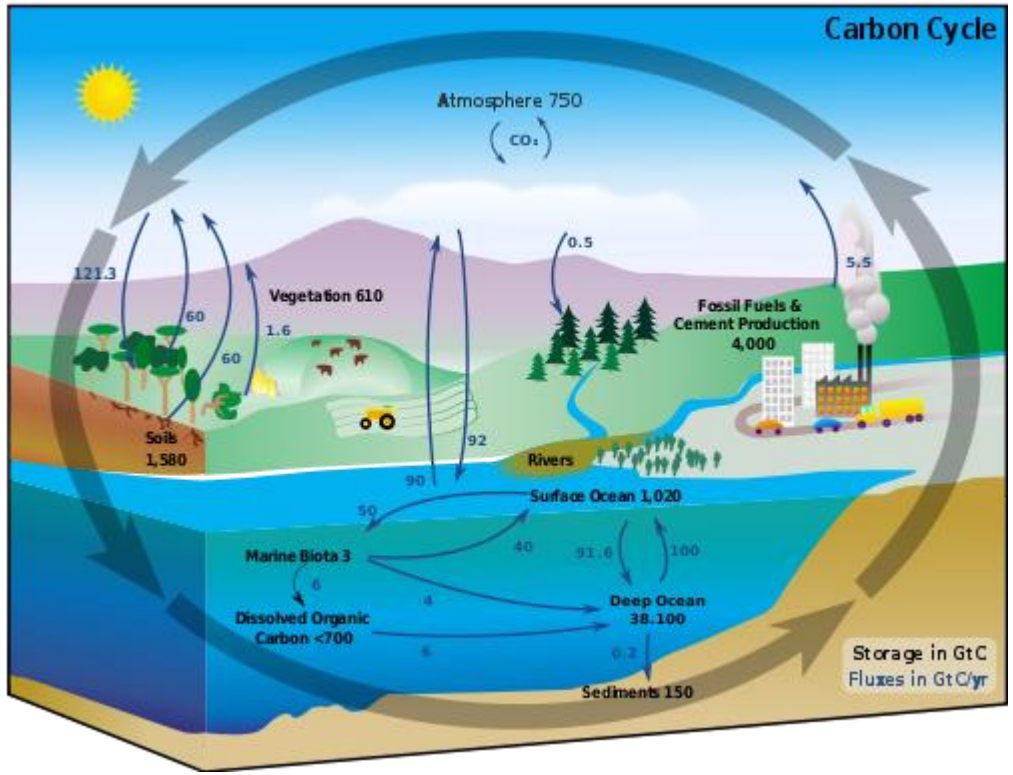
- Source
  - Evaporation from water sources
  - Transpiration from plants and soil
  - Sublimation
- Sinks
  - Oceans, Ice Sheets, Glaciers, Groundwater, Soil
- Human Influence
  - Changes to Forests, agriculture (planting and clearing)

VA #6 San Luis Reservoir, California

NOTES

Carbon Dioxide

- Sources
  - Cellular respiration, Forest fires, Volcanoes, Decomposition of living matter, Fossil fuels, Soils
- Sinks
  - Fossil fuel deposits, Oceans, Vegetation, Photosynthesis
- Human Influences
  - Industrial processes, Burning fossil fuels, Mining, Deforestation, Animal population changes, Burning of plant matter



NOTES

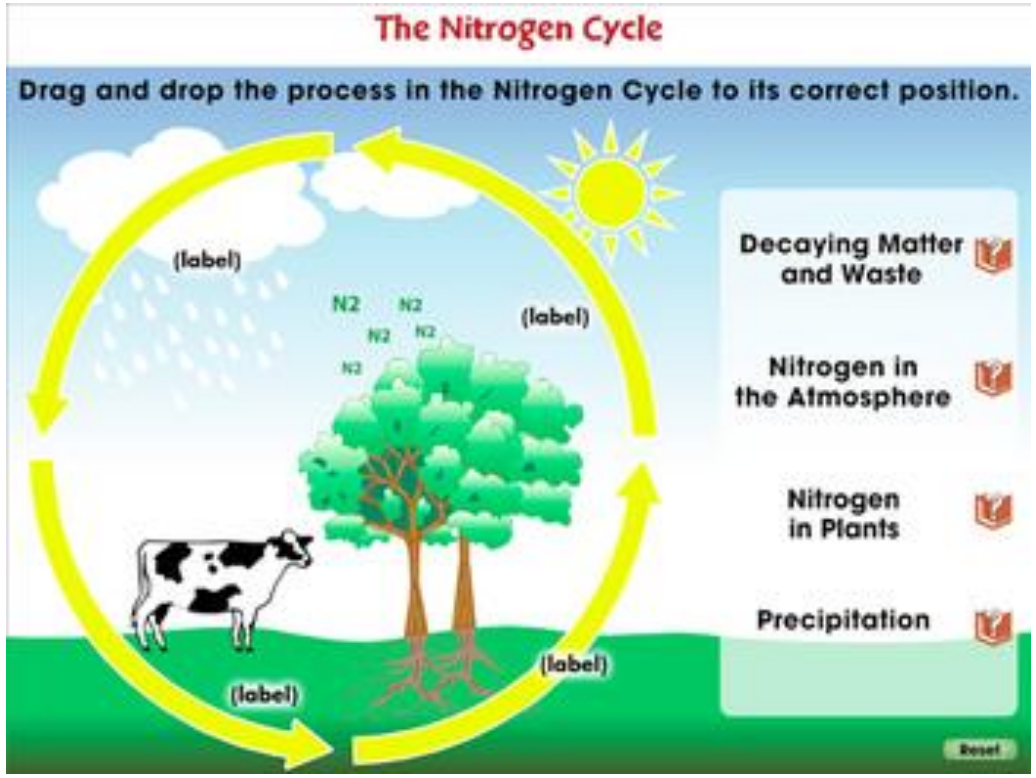
Methane

- Sources
  - Atmosphere, decomposition of plant matter, bacteria
- Sinks
  - Permafrost, peat bogs, wetlands, soil
- Human Influences
  - Mining (fracking), landfill and sewage emissions, farm animal waste, land use changes

NOTES

Nitrous Oxide

- Sources
  - Atmosphere, decomposition of living matter, soil, animal waste, bacteria, nitrogen-based fertilizers
- Sinks
  - Light driven reactions (photolytic reactions) in stratosphere (atmosphere)
- Human Influences
  - Moving soil for agriculture, nitrogen rich fertilizers



NOTES

Other

- GHGs:
  - chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), nitrogen fluorides (NF_3)
- Sources
  - Human made halogens, perfluorocarbons, sulfur hexafluoride, nitrogen trifluoride
- Sinks
  - Atmosphere
- Human Influences
  - Use of halogens and other GHG compounds in manufacturing and industrial activities.

CLOSURE

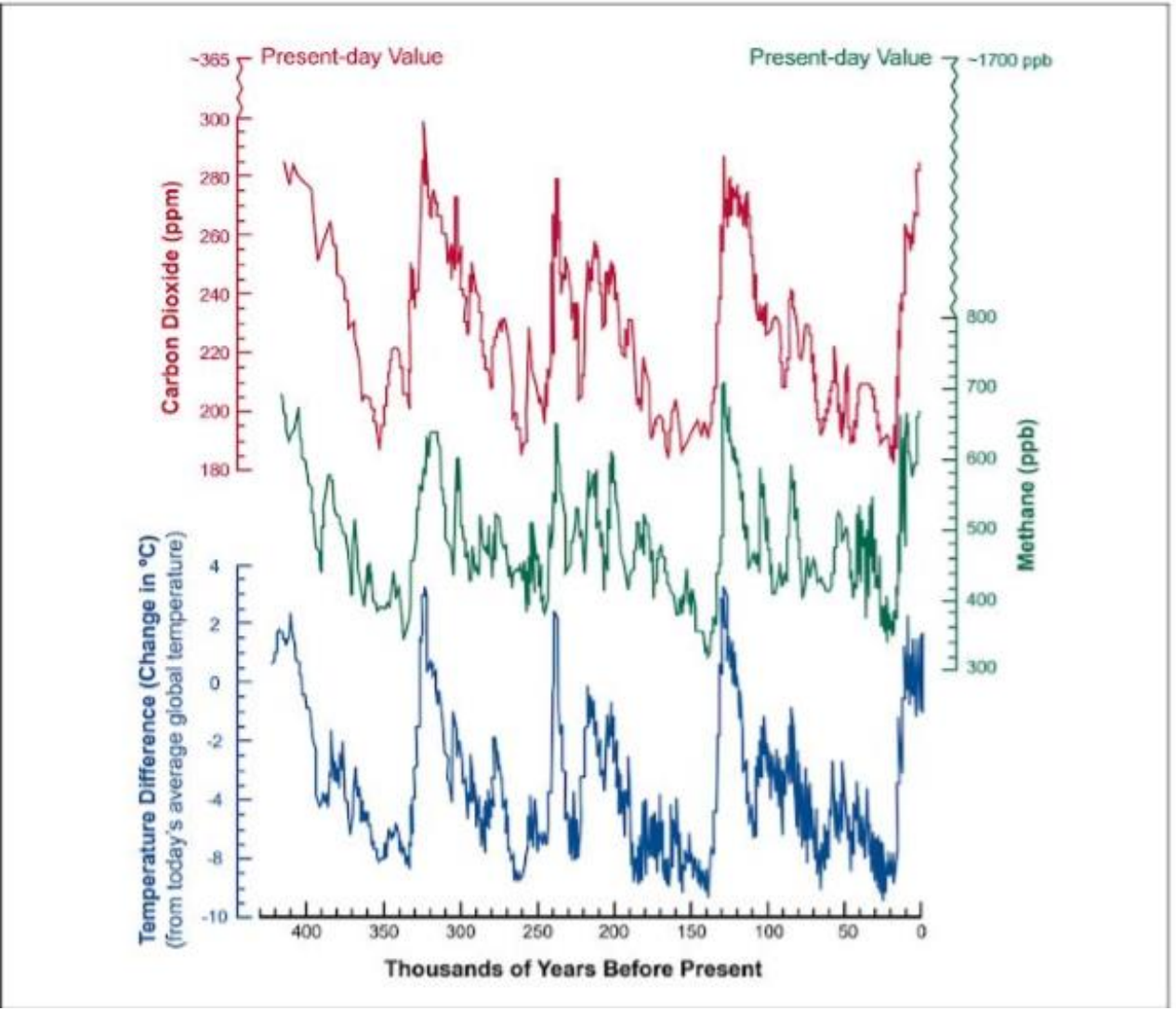
- Answer Guiding Question on page 9:
  - What is the role of natural and human communities in the production of greenhouse gases?

- Benchmark #4 next block (5/2 & 5/3).

- Achieve 3000: “Making the World Clean and Safe” due Friday, 5/4.

WHAT ARE WE DOING?

- Reading the Ice(workbook pages 14-15)
  - Use page 15 in reader to answer the questions on pages 14-15.
  - Use the next slide as a resource.



The data to the left is from an ice core drilled at Vostok, Antarctica. The red line (top) shows the concentration of carbon dioxide there. The green line (center) shows the concentration of methane at the site. The blue line (bottom) shows the average temperature, plotted as the difference from today's average temperature (represented by the 0° C line).

Notes: These are the values measured in the ice cores.

0 on the Y-axis indicates the average temperature over time, not the actual temperature. Other numbers on the Y-axis indicate the difference from the average temperature.