

Pre-lesson Terminology:

Here is a primer to help lay the foundation for teaching the curriculum in this lesson.

Carbon cycle: the natural process by which carbon is exchanged between the earth, atmosphere and water to sustain life. Billions of tons of carbon are released by some elements in the cycle (such as humans) and absorbed by others (such as trees, plants and oceans). When in balance, these emissions and removals are roughly equal. According to the U.S. Environmental Protection Agency, human activities since the 1700s have unbalanced this equation, increasing CO₂ concentrations in the atmosphere.

Carbon dioxide: CO₂, a gas produced in the creation and consumption of energy. Burning fossil fuels (coal, oil and natural gas) is the main source of the CO₂ produced by humans. It isn't the only byproduct of burning fuel, but it is the most prevalent, and it has the potential to be the most dangerous if its levels in our atmosphere are allowed to rise.

Carbon footprint: the measurement of one person's or one organization's carbon dioxide emissions. In general, the smaller a footprint, the less damage it is doing to the environment.

Climate change: any change in global temperatures, widely believed by the scientific community to be on a severe uptick in the modern era. For example, climatologist James Hansen, director of the climate-research facility at the NASA Goddard Institute for Space Studies, told *Newsweek* in 2009 that "the evidence for humanmade climate change is overwhelming."

Fossil fuel: coal, oil, natural gas and any other fuel composed within the earth from natural substances. Most of the world's energy is produced from the burning of fossil fuels, which are non-renewable resources. When they run out, they are gone.

Greenhouse effect: the warming of the atmosphere by the presence of the "greenhouse gases": carbon dioxide, methane, nitrous oxide, ozone and water vapor. These gases trap the sun's radiation and keep the atmosphere warm. Without them, the Earth would be too cold to sustain life. But if the atmosphere fills with higher concentrations of them, too much heat becomes trapped, and global temperatures rise.

Renewable energy: sources of power that cannot be depleted, unlike fossil fuels. These sources include solar, wind, hydroelectric and biomass. These fuels have the added benefit of producing few or no carbon emissions as part of their production.