



Carbon and Climate Change Teacher Backgrounder

- Climate change is a variation in the climate (temperature, wind, precipitation patterns etc.). While it may be caused by a variety of natural processes scientific evidence increasingly indicates that it is caused by human activities. Since the advent of the industrial revolution, anthropogenic carbon emissions have skyrocketed and along with it the average global temperature.
- Specifically, carbon impacts the climate through the greenhouse effect. The greenhouse effect is the role the atmosphere (the envelope of gases surrounding the earth) plays in insulating the planet from heat loss. When sunlight enters the atmosphere a portion of it is absorbed by the earth's surface. The rest bounces off the earth's surface, as thermal infrared radiation, and heads back towards the atmosphere. The job of greenhouse gases is to trap the thermal radiation in order to keep the earth warm. When the atmosphere contains the naturally occurring concentrations of greenhouse gases the temperature levels out at 14 degrees Celsius instead of what it would be otherwise which is -19 degrees Celsius! As you can see, we need this blanket to keep us warm.
- Unfortunately, however, anthropogenic emissions, caused by burning fossil fuels such as carbon dioxide, methane, and nitrous oxide, as well as deforestation, are increasing the concentration of these greenhouse gases which means that the global temperature is also increasing! This has an impact on all of earth's climate systems. In fact, through a combination of burning fossil fuels and deforestation, humans have released so much carbon into the atmosphere that the atmosphere contains 32 percent more carbon dioxide than at the beginning of the 20th century! In Ontario the biggest sources of greenhouse gas emissions come from transportation, industry, buildings, electricity and heat generation, agriculture, and waste.

(Information adapted from: <https://www.peelregion.ca/planning/teaching-planning/pdfs/Grade9forWeb.pdf>)