

STEM from Home

Calculating Carbon Footprints

Climate change is a global cause for concern and impacts human life and indeed our survival in the long run. In this STEM Pack let us explore some basic reasons which are the cause for climate change. You must have come across terms such as greenhouse effect or global warming. One of the major causes of global warming is use of fossil fuels. Fossil fuels are deposits of organic matter that have formed over millions of years from decomposing plants and animals occurring naturally. We have been using some of these fossil fuels for thousands of years. Few of these fuels have only been used for the past couple of decades. Some examples of fossil fuels are coal, oil, and natural gases.

Major concern about the use of fossil fuels is with one of the by-product of their combustion, i.e., carbon dioxide (CO₂). Carbon dioxide is a greenhouse gas. We may not realize it, but we are burning fossil fuels for a number of our day-to-day activities, resulting in addition of excessive CO₂ in the environment.

In this STEM Pack you will engage in:

- an online calculation to ascertain the carbon footprints of you and your family;
- use data to generate a list of top countries producing excessive carbon footprints
- finally analyse another data set to understand which industry sectors contribute the most to high CO₂ emissions.

Main Activity: Calculate Your Carbon Footprint

Introduction

In today's activity, you will use the information you have gathered from the given links and some data to calculate an estimate of your carbon footprint - the amount of CO₂ you produce each year.

We know use of fossil fuels is the primary cause for increased carbon footprints. Many factors are considered when calculating carbon footprints. For example: When you go to the grocery store in your car it burns fuel. The grocery store itself is powered by electricity. Employees of the store come to work using their own vehicles or public transport. All this adds to the total carbon footprint. In addition, items of the store are produced in factories and transported from remote places. All these contributors are considered while calculating carbon footprints for a simple activity like shopping.

Pre- Work Reading

- [Global Warming 101](#)
- [Fossil Fuels](#)
- [Carbon Footprint](#)
- [Carbon Footprint and You](#)
- [Meet the Greenhouse Gases](#)

What You Will Learn

- Relationship between human activities and CO₂ levels in the environment
- How to calculate a rough estimate of carbon footprints per person each year

What You Will Need

Hardware

A computer connected to the internet.

Software

A modern web browser like Microsoft Edge, Chrome, or Firefox.

Bonus Activities

Activity 1: Calculating Carbon Footprints

You are provided with a dataset of different countries. The dataset contains information about per capita CO₂ emissions of some countries. Your task is to identify countries which are responsible for the highest emission of CO₂.

What You Will Learn

Identify the countries with maximum carbon footprints.

Getting Started

You can access [guidelines for the activity](#) here.

What You Will Learn

Hardware

A computer connected to the internet.

Software

A modern web browser like Microsoft Edge, Chrome, or Firefox.

A spreadsheet program like Microsoft Excel.

Getting Started

You can access [guidelines for the activity](#) here.

Challenge Activity: Carbon Footprints – Major Contributing Sectors

You are provided with a dataset. The dataset contains information about contribution in CO₂ emissions by different industries viz. Energy, Industrial Processes, Agriculture, Waste, Land-Use Change, and Forestry.

You can access the dataset by clicking on the following link.

Sectors -Emission

Observe and analyse the data and answer the following questions.

- Which sector produces the most greenhouse gas emissions?
- What sectors are the fastest growing sources of greenhouse gas emissions?

To do: Research and find the top 3 ways that humans are generating CO₂ from fossil fuels.

Share your findings and the results by uploading a presentation. Your final submission can be presented digitally using [Docs](#) or [Presentation](#) software.