|  |  |
| --- | --- |
| **Equivalency Problem** | #1: Hamburger or miles? |
| **Student** | Suraj Sehgal |
| **Assumptions:** | |
| [list any assumptions you will take into account for your calculation, either from the prompt or any that you have included]   * 2021 Kia Sportage is going to be the [**2021 Kia Sportage FWD**](https://www.fueleconomy.gov/feg/noframes/42595.shtml) 4 cyl, 2.0 L, Automatic (S6) * My home is going to be my current apartment in Berkeley. The store will be the nearest Safeway to my apt. Based on Google Maps, I will use the distance that comes from the fastest route (since this is what I normally do). * Will use averages for beef * Using combined city/highway for Kia mileage * Kia sportage is a standard, mid-sized gasoline internal combustion engine vehicle | |
| **Calculation:** | |
| [plot your calculations here, it’s ok to include a screenshot of excel or other sources that you use. Make sure you list the steps that you take and that you highlight the result]   * ~~d = 6.2 miles (distance from my apartment to the nearest Safeway)~~ [misunderstood the question] * 99.48 kg CO2eq is the emissions for 1kg of Beef [Statista] * 23 mpg for Kia Sportage * Estimate for embedded carbon in production is 5.6tCO2e [Zemo] = 5,600 kg CO2 * Every gallon of gasoline creates about 8.887 kg of CO2 when burned [EPA] * Just looking at car mileage: 99.48 kgCO2/8.887 kgCO2 = 11.19 gallons * 11.19 gallons \* 23mpg = 257.46 miles * ”Tofu” has a benchmark climate footprint of 1.4 kg CO₂e/kg * 1.4 / 8.887 \* 23 = 3.62 miles * 5,600 kg CO2 / 8.887 = 630 gallons \* 23 = 14,493 miles | |
| **Reflection:** | |
| [This is an open space for you to reflect on the result that you have achieved. The following questions can serve as a guide: What has this equivalency problem opened your eyes to? Was the result surprising? How so? Did it help you challenge any previous assumptions?]   * Beef is a lot of miles. I was surprised at how high the number was. * The embodied carbon in production of car also seems intensely high. Even more the car hits the road and starts to put carbon out in the air, it has already “driven” a lot of embodied carbon miles! * As a vegetarian, it has further confirmed my lifestyle choice to avoid beef. However, it does spark an interest in me about other products from cows and how they may also produce a carbon impact. * It is interesting to see how drastically different an alterative like tofu might be in comparison | |
| **Sources:** | |
| * [Statista](https://www.statista.com/statistics/1201677/greenhouse-gas-emissions-of-major-food-products/) * [EPA](https://www.fueleconomy.gov/feg/bymodel/2021_Kia_Sportage.shtml) * [Zemo](https://www.zemo.org.uk/assets/workingdocuments/MC-P-11-15a%20Lifecycle%20emissions%20report.pdf) * [EPA – gas emissions](https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=P100JPPH.TXT#:~:text=3%20Every%20gallon%20of%20gasoline,as%20standards%20become%20more%20stringent.) * [Carbon Cloud](https://apps.carboncloud.com/climatehub/product-reports/id/224275434558#:~:text=%E2%80%9DTofu%E2%80%9D%20has%20a%20benchmark%20climate,match%20the%20latest%20climate%20science.) | |