**Can What You Eat Change the Climate?**

* How does the growing demand for food impact our climate?
* Can what you eat give your neighbor asthma?
* What is your carbon footprint? How is it related to the climate?

**Your Carbon Footprint**

Everything you do in your daily life (where you go and how you get there, how much electricity and battery power you use, what you buy, what you eat, etc.) causes greenhouse gases (e.g. carbon dioxide, methane, and nitrous oxide) to be released (emitted) into the atmosphere. Your carbon footprint is a measurement of how much greenhouse gas (measured in grams of CO2) is emitted as a consequence of what you do.

Calculating your carbon footprint is tricky, because there are many components. Which components affect climate the most? Which ones can we control, and perhaps, do something about?

**Opening Activity: How does what you eat affect your carbon footprint?**

Think about a type of food that falls into one of the categories below:

* Cereal/carbs (tortilla, pasta, bread)
* Red meat
* Chicken/eggs/fish
* Dairy (cheese, milk)
* Fruit/vegetables
* Oils/sweets

Carbon Footprint of Transport

Make assumptions about how your food item got to market, i.e., is it produced or grown domestically (e.g. from a local farmer’s market ) or from a source outside of the U.S. (imported)?

**Use the table below to calculate the carbon footprint of transport of your food item.**

|  |  |
| --- | --- |
| **Transport Mode** | **Emission Factor (g CO2/kg.km)** |
| Truck | 0.180 |
| Rail (train) | 0.018 |
| Ocean tanker | 0.010 |
| Air cargo | 0.680 |

*Note: 1 tonne = 1000 kg*

Example:

If 1 kg of apples travels 3000 km by ocean tanker, the carbon footprint would be:

(0.010 g CO2/kg . km) x (1 kg . 3000 km) = **30 g CO2**

If the same 1 kg of apples then travels 90 km by truck, the carbon footprint would be:

(0.180 g CO2/kg . km) x (1 kg . 90 km) = **16.2 g CO2**

The total carbon footprint for both parts of the journey would then be **46.2 g CO2.**

**Next, convert the carbon dioxide to carbon by multiplying the carbon dioxide by 12/44 (the ratio of the molecular weight of carbon to carbon dioxide).**

**YOUR ITEM \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g carbon**

**Make a pile of charcoal briquettes that are equivalent in mass to the carbon footprint you calculated.**

Carbon Footprint of Food Production

**Use the table below to calculate the carbon footprint of production of your food item.**

|  |  |
| --- | --- |
| **Food Item** | **Emission Factor (kg CO2/$)** |
| Cereal/carbs | 1.00 |
| Red meat | 3.73 |
| Chicken/eggs/fish | 1.35 |
| Dairy | 3.59 |
| Fruit/veggies | 1.19 |
| Oils/sweets | 0.86 |

**Make a pile of charcoal briquettes that are equivalent in mass to the carbon footprint you calculated.**

**More on Food and Carbon Footprints**

How your food is grown, stored, transported, processed, and cooked can all affect greenhouse gas emissions, thus climate change. Some food items travel half-way around the world, involving an adventurous journey with tractors, trucks, trains, boats, cars, even airplanes! Some food items only travel a few feet to go from the farm to the dinner table. The distance the food travels and how it gets there determines how much carbon will be emitted into the atmosphere. The typical American’s prepared meal contains, on average, ingredients from at least five countries outside of the U.S.

Between 1968 and 1998,

* World population increased by 91%
* World food production increased by 84%
* **Food trade increased by 184%**

In 2005, about 250,000 tons of CO2 were attributed to imports of food products to California.

**The Carbon Footprint of Transporting Food**

*Food Miles – a simple metaphor to contrast local and global food systems*

Last year, the California Air Resources Board attributed worsened air quality from food imports due to food transport. This resulted in

* 950 cases of asthma
* 16,870 missed school days
* 43 hospital admissions
* 37 premature death

**Calculating Your Yearly Carbon Footprint**

Make a prediction about what you annual carbon footprint might be in kg CO2/yr. What percentage of your carbon footprint is attributed to the transport and production of food? How do you think your carbon footprint compares to the national and global average (is it the same, smaller, or larger)?

Go to the following website and take the survey, answering the questions to the best of your ability. Don’t hesitate to make guesses.

<http://i2i.stanford.edu/NewFootprint/footprint.html>

At the end of the survey, record your carbon footprint below:

Total Carbon Footprint (last year) = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Fill in the following table:

|  |  |  |
| --- | --- | --- |
| **Category** | **Footprint (kg CO2)** | **% of Total Footprint** |
| Transportation |  |  |
| Home |  |  |
| Food |  |  |
| Purchases |  |  |

**Calculating Your Hourly Carbon Footprint**

\_\_\_\_\_\_\_\_\_\_\_\_\_ total annual footprint (kg CO2/yr) x (1 yr/365 d) x (1 d/24 h) x (1000 g/kg)

= \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g CO2/hr

Convert the carbon dioxide to carbon, multiply the carbon dioxide by 12/44 (again, the ratio of the molecular weight of carbon to carbon dioxide).

Your hour carbon footprint \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g carbon/hr

**Make a pile of charcoal briquettes that are equivalent in mass to the carbon footprint you calculated. You may want to separate the piles according to category, i.e., transportation, home, food, and purchases.**

**Compare your results with your neighbors in the room.**