

CO2: How Much Do You Spew?

Family: _____

<p>1. Driving: _____ Miles driven per year by the vehicle _____ Miles per gallon (mpg) for the vehicle (average) Divide: miles driven by miles per gallon = gallons used per year Multiply: gallons used per year by 22 pounds of CO₂ Do the above calculations for each car or truck that the family drives. Add the pounds of CO₂ for all cars and trucks </p>	<p>Pounds of CO₂ from driving</p>
<p>2. Flying: _____ total miles of air travel per year for all people Multiply: total miles traveled by 0.9 pounds of CO₂ = <i>Note - Total the miles travelled by each family member. (For example, if four people take a 1000 mile flight, the total is 4000 miles.)</i></p>	<p>_____ Pounds of CO₂ from air travel</p>
<p>3. Mass Transit: _____ miles on mass transit per year by all people Multiply: mass transit miles by 0.5 pounds CO₂ = </p>	<p>_____ Pounds of CO₂ from mass transit</p>
<p>4. Taxis and Limos: _____ miles by taxi/limo per year by all people Multiply: taxi and limo miles by 1.5 pounds of CO₂ = </p>	<p>_____ Pounds of CO₂ from taxi/limo</p>
<p>5. Electricity: _____ Kilowatt hours (kWh) per year per household Multiply: Kilowatt hours by 1.5 pounds of CO₂ per kWh = </p>	<p>_____ Pounds of CO₂ from electricity</p>
<p>6. Heating Oil: _____ gallons per year per household Multiply: gallons of oil by 22 pounds of CO₂ per gallon = </p>	<p>_____ Pounds of CO₂ from heating oil</p>
<p>7. Natural Gas: _____ therms per year per household Multiply therms of natural gas by 11 pounds of CO₂ = </p>	<p>_____ Pounds of CO₂ from natural gas</p>
<p>8. Bottled gas or Propane: _____ gallons per year per household Multiply gallons per year by 13 pounds of CO₂ =</p>	<p>_____ Pounds of CO₂ from gas/propane</p>
	<p>_____ TOTAL pounds of CO₂ emitted by this family</p>

Adapted from measurements developed by the National Audubon Society

What does this mean?

The total pounds of CO₂ you just calculated is only one third of the emissions for which this family is responsible. The other two thirds come from the businesses that provide the family with services such as stores and factories.

If you just calculated less than 11,000 pounds per person, then the family you are analyzing is to be congratulated. They are using less energy than 1990 levels, which is compliant with Kyoto Protocol recommendations (CO-OP America Quarterly).

Think about it! How could they reduce their emissions?

How could the family you analyzed reduce the amount of CO₂ they produce? What would you change about the way they live to decrease emissions?

Discussion:

- Once all student groups have calculated the yearly CO₂ emissions for their family, have each group partner with one of the other groups and compare and contrast their families' lifestyles and use of energy.
- As a class, have each group describe the family they analyzed and their total emissions to the class. Create a table on the board recording the emissions for each family.
- Ask students why there are such large differences in the amount of emissions.
- The Kyoto Protocol recommended that emissions be reduced to at or below 1990 levels. That means less than 11,000 pounds of CO₂ per person per year. Have students look at the table and consider how many of the families are meeting that goal.
- Ask students which activities emitted the most CO₂ and how they would change their scenario to reduce CO₂ emissions.
- Ask students to brainstorm ways in which emissions might be lowered from global agreements to individual actions

Extend the activity into real life! Have students bring a copy of the worksheet home to complete with their family. (Families will need to collect their own data such as car mileage, plane flights, electric and gas bills in order to do the calculations). Have students brainstorm ways that they and their families could cut emissions. What would family members be willing to do or give up in order to make reductions in greenhouse gas levels? Are these changes easy or difficult to implement? Is there a cost to initiate them or is there a cost savings?