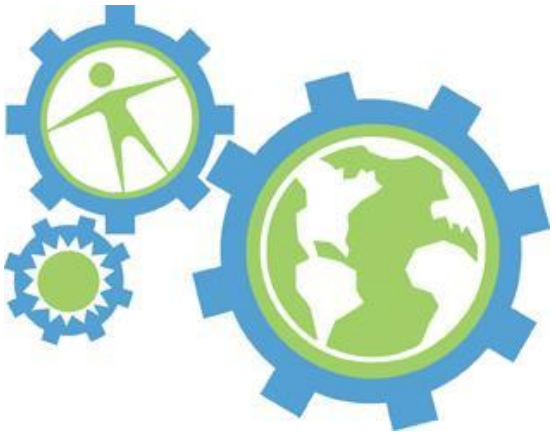
Carbon Footprints & Sustainable Solutions:



Inspiring NC Youth to Address Global Warming

environmental resource program

Dana Haine
UNC-CH Institute for the Environment

The Environmental Resource Program

- Serves as the outreach and public service arm of UNC's Institute for the Environment.
- Promotes environmental stewardship and public health through education, research, and community service.
- Links the environmental resources of UNC to the people of North Carolina.

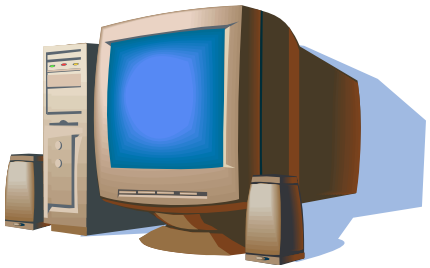
Session Agenda

- Welcome and Introductions
- Activity 1: What is your Carbon Footprint?
- Activity 2: What is Sustainability?
- Activity 3: Hidden Energy:
  Secondary Carbon Footprints

List the various ways you depend on energy in a typical day.

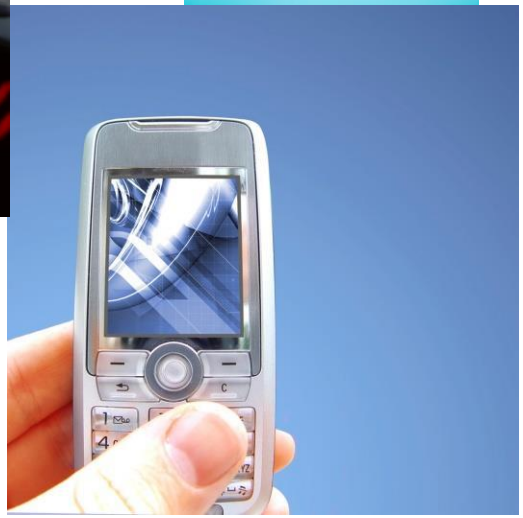
List the various ways you depend on energy in a typical day.





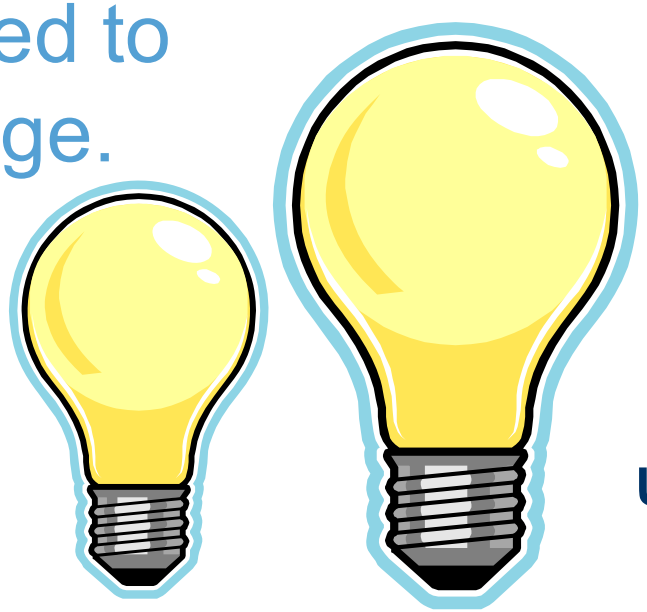






American Energy Consumption

- Americans consume 40% more energy per person compared to the world average.



World

5.0 TOE/person

United States

8.35 TOE/person

Total primary energy supply TOE (tons of oil equivalent) per person (2000).
IEA, Energy Balances of OECD Countries 1999-2000 (IEA, Paris, 2001).

Where does our energy come from?

Where does our energy come from?

- Fossil fuels (Natural Gas, Oil, Coal)
- Nuclear Power
- Hydropower
- Wind Power
- Solar Power
- Landfill Methane

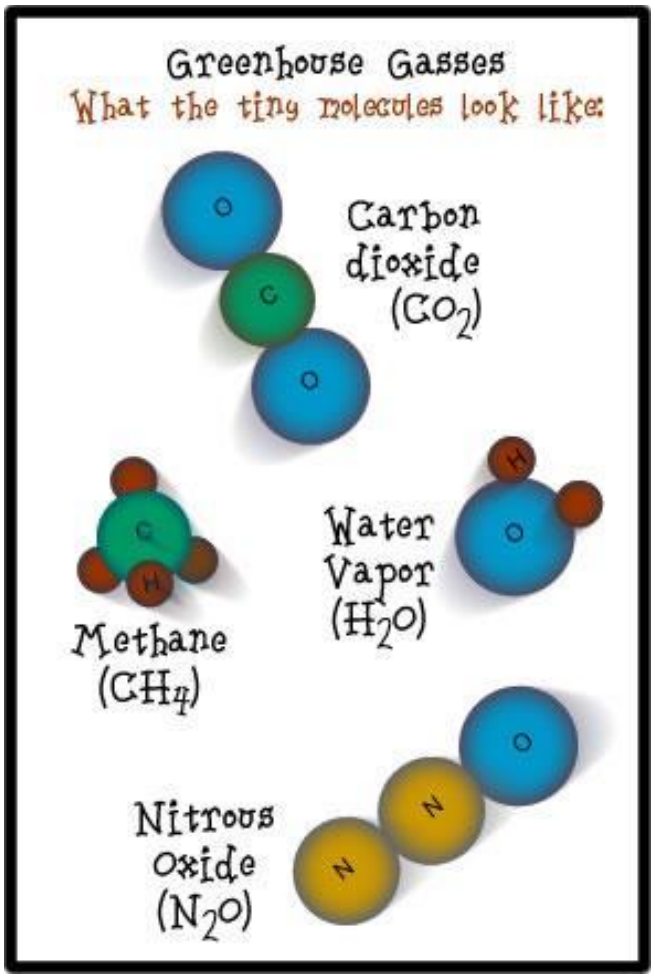
Renewable Energy

What is the connection between Energy and Carbon Dioxide?

What is the connection between Energy and Carbon Dioxide?

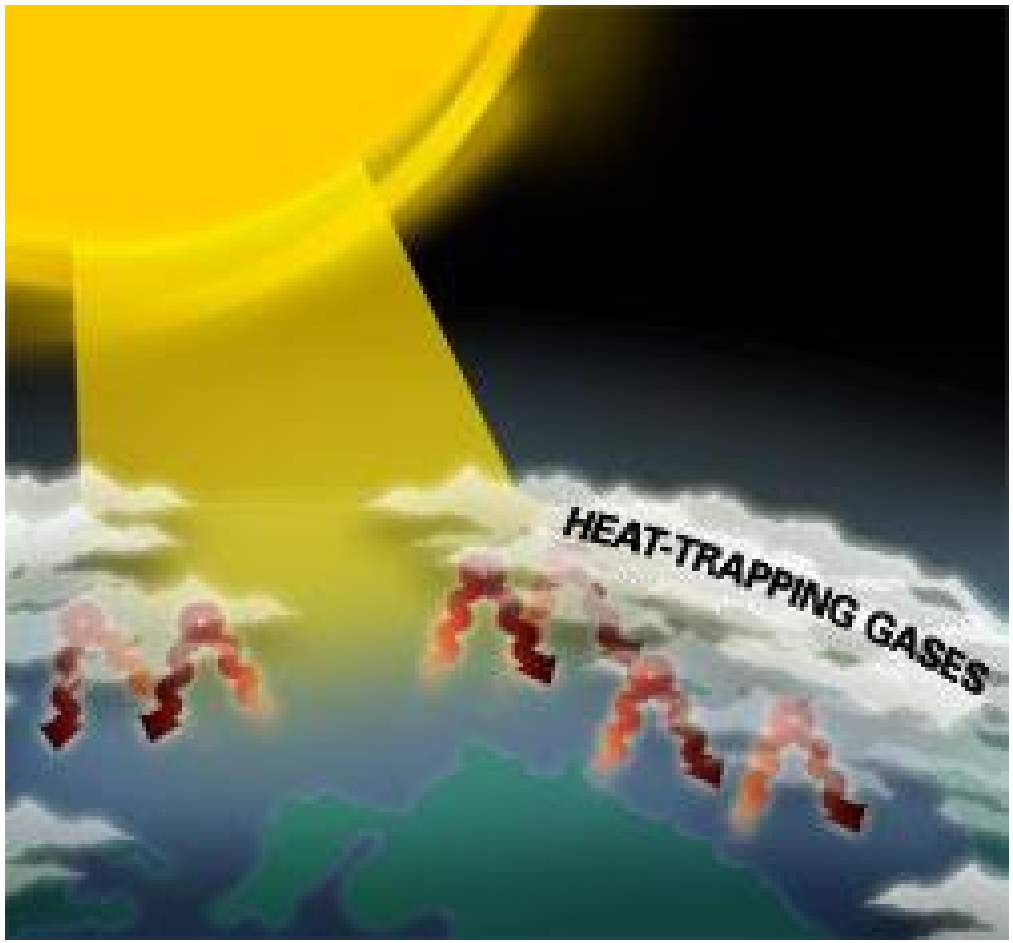
=

Energy Use



CO_2 makes up approximately 85 percent of total greenhouse gas (GHG) emissions.

What is the connection between Carbon Dioxide and Global Warming?

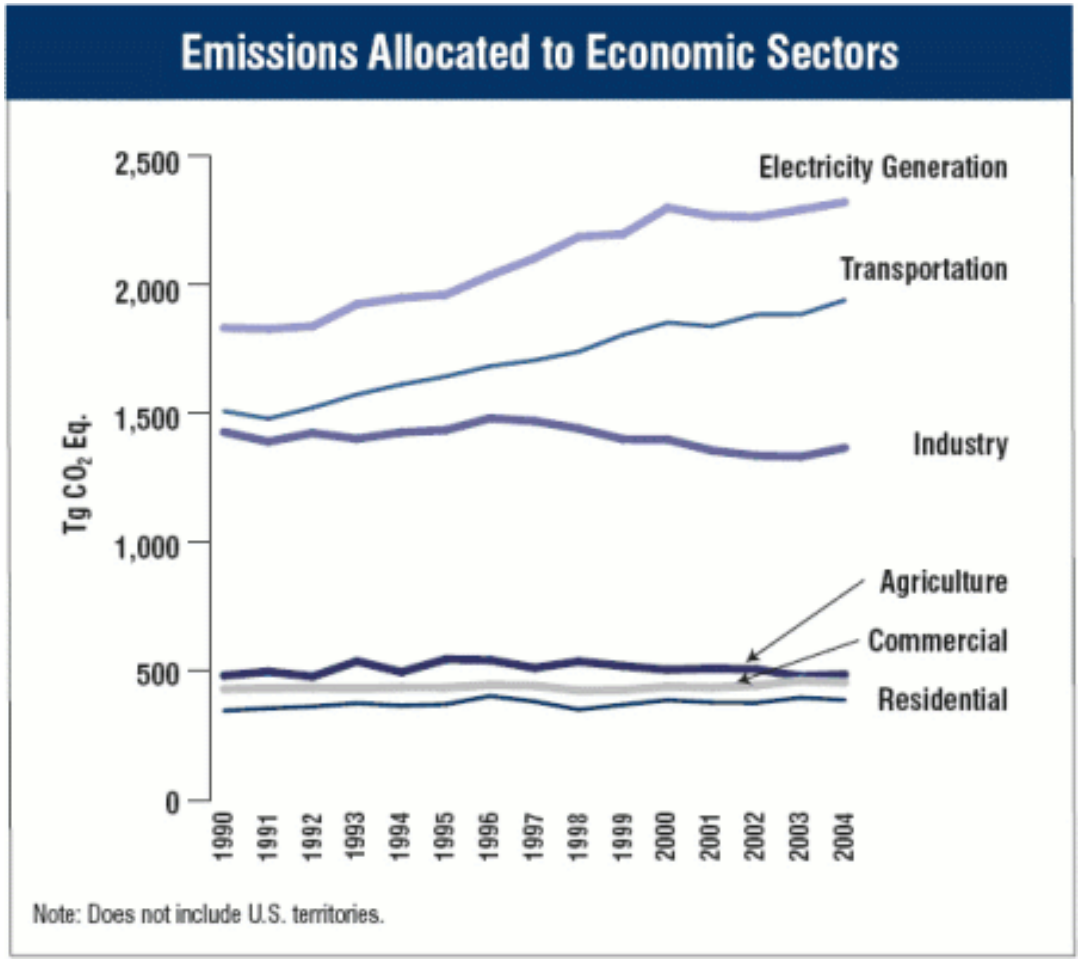


http://www.fightglobalwarming.com/page.cfm?tagID=273

What human activity produces the most greenhouse gases (CO_2)?

What human activity produces the most greenhouse gases (CO_2)?

1. **Electricity Generation**
2. **Transportation**
3. **Industry**
4. **Agricultural**
5. **Commercial**
6. **Residential**



Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2004, EPA.

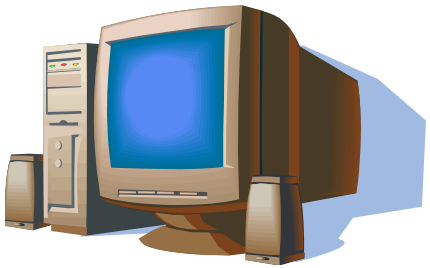
Electricity Generation:

- Where does your electricity come from?

  EPA's Power Profiler

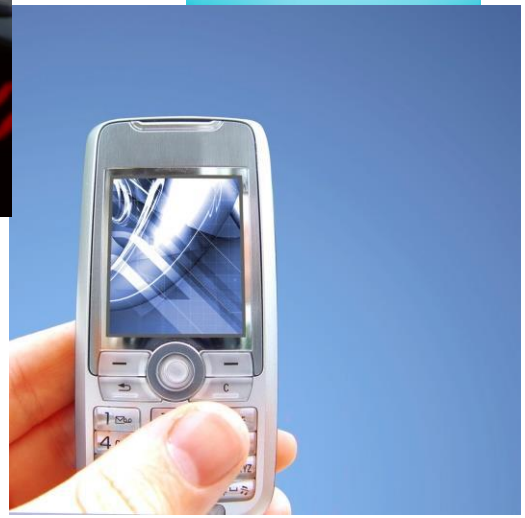
The average person generates 94lbs of CO_2 per day.









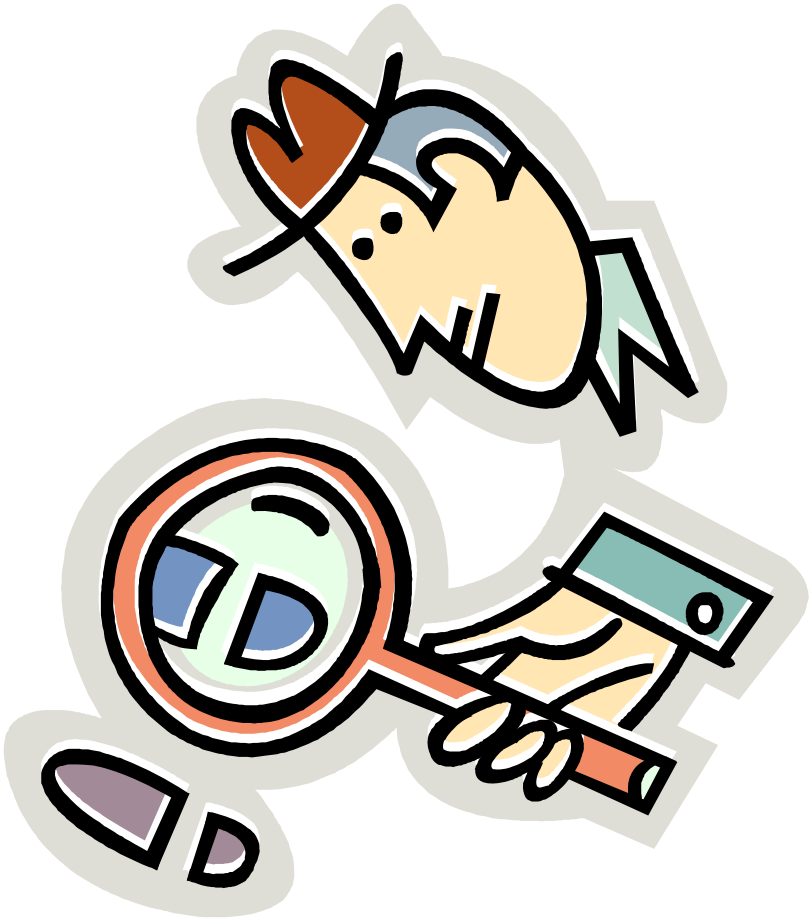


Activity 1:
What is your Carbon Footprint?

- Go to EPA's Carbon Footprint Calculator
  http://www.epa.gov/climatechange/emissions/ind_calculator.html
- Please complete the companion *Carbon Footprint* worksheet (provided) as you calculate your carbon footprint.

Carbon Reduction Solutions

- What can **YOU** do to reduce your carbon footprint?

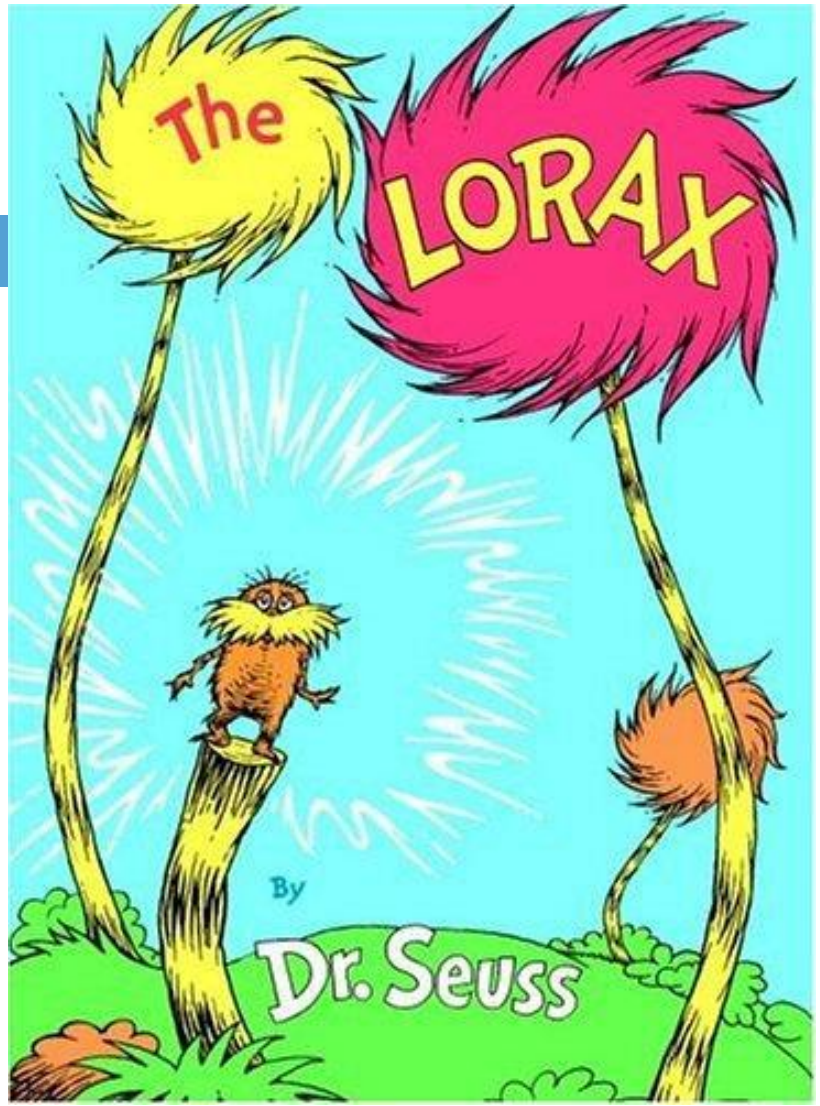


Carbon Reduction Solutions

- Reducing CO_2 emissions benefits:
  - The environment
  - The economy
  - Society

- Practices that benefit all three of these are said to be **sustainable.**

Dr. Seuss's *The Lorax* can be used to help students discover the concept of sustainability.



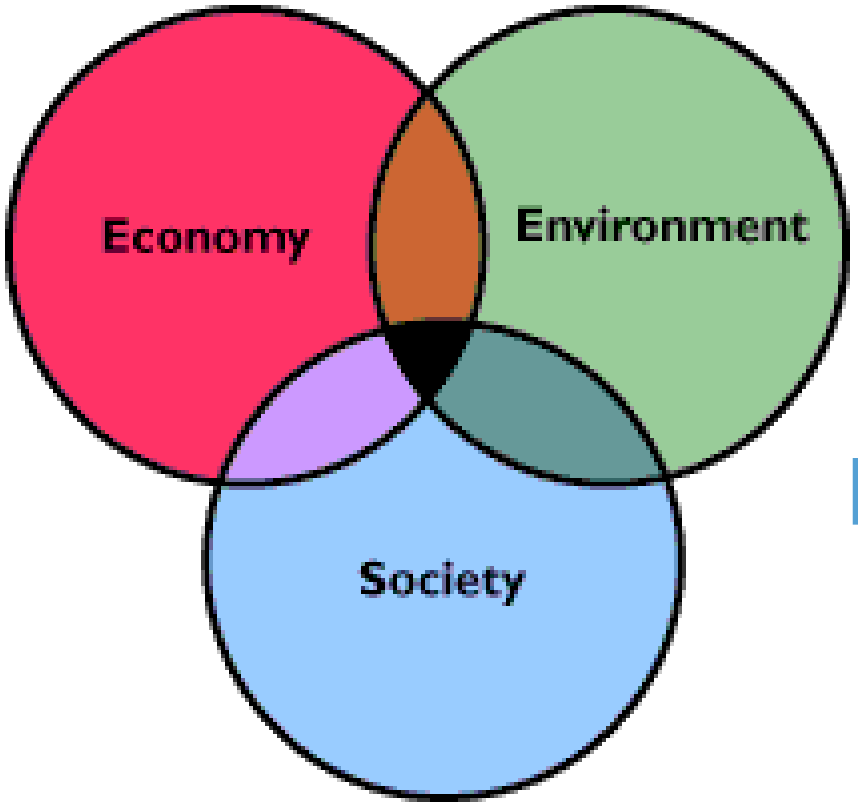
Sustainability

- Common use of the term “sustainability" began with the 1987 publication of the World Commission on Environment and Development report, *Our Common Future*.

Sustainable Development

- "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."
  - Our Common Future

Three Parts of Sustainability



Healthy **Environment**
Healthy **Economy**
Healthy **Society**

From: http://www.sustainablemeasures.com

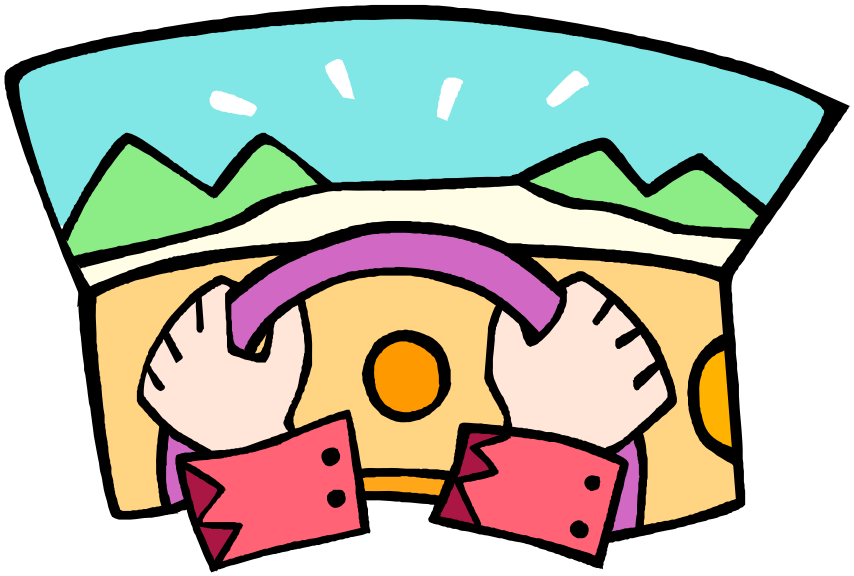
Is this sustainable?

http://www.chrisjordan.com/

Is it Sustainable?

- Can this activity be done without causing damage in these three areas?
- Can this activity be done so that people in the future will have the same opportunities to do this activity?

Is it Sustainable?



Driving

Think-Pair-Share Activity #1

Driving

How does driving impact the:

Environment

Economy

Society

Is it Sustainable?

Choose one:

Individual Activities

School Activities

Government Actions

Business Products/Services

Think-Pair-Share Activity #2

Individual activities -Owning/using a cell phone -Driving above the speed limit -Eating at McDonald's for breakfast -Drinking bottled water at lunch -Shopping at the Saturday farmer's market	**School activities** - Hosting a Friday night high school football game - Going on a class field trip to the zoo - Buying recycled paper for copiers - Selling soft drinks in vending machines - Allowing students to drive off-campus for lunch
Government actions - Offering curbside trash pick-up - Raising the fee to ride public transportation - Building an energy efficient courthouse - Building sidewalks to the local high school from neighboring suburbs	**Business products/services** - Making computers - Producing organic cotton T-shirts - Building a 5,000 sq ft. house in the suburbs - Building a restaurant on a vacant lot - Home delivery of a daily newspaper - Raising pasture-fed beef to sell to consumers

Is it Sustainable?

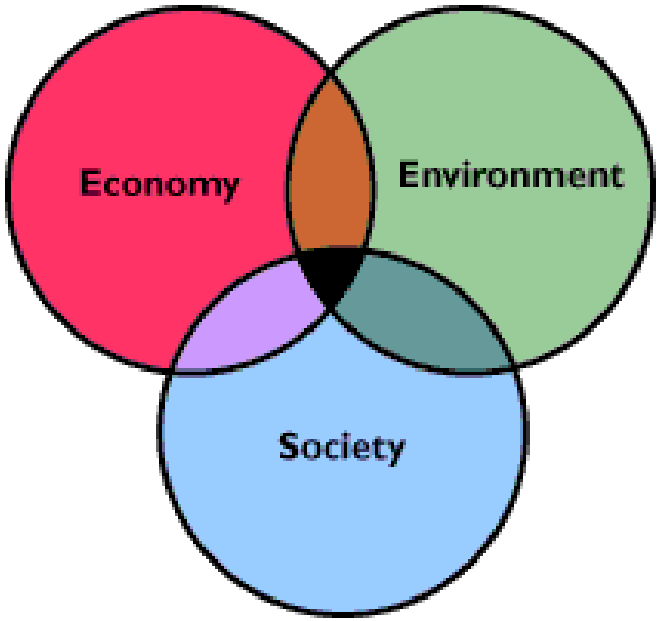
- In your group, assess the sustainability of one activity from this list and determine whether it is economically, environmentally, and/or socially sustainable.
- You need to be able to explain your decision(s) to the class.

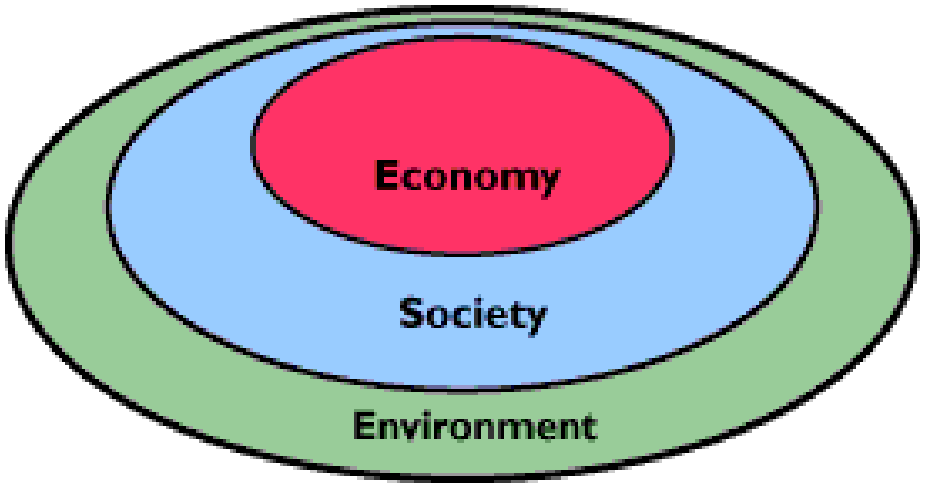
Sustainability Scale

Can something that is unsustainable be altered to become more sustainable?

Choose an unsustainable activity and explain how it could be made more sustainable.

Three parts of sustainability: *Two Interpretations*





From: http://www.sustainablemeasures.com

Carbon Reduction Solutions

- Reducing CO_2 emissions benefits:
  - The environment
  - The economy
  - Society

- Practices that benefit all three of these are said to be **sustainable.**

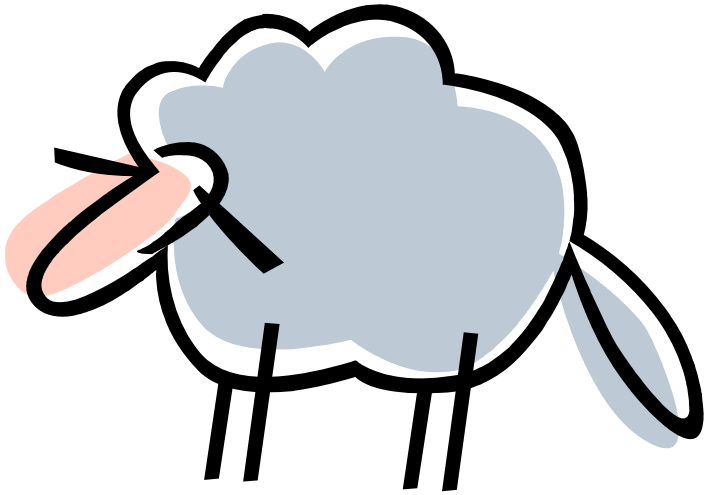
Carbon Reduction Solutions

- Individual behaviors and consumer choices impact an individual's carbon footprint.

One Strategy – Eat Local?

Is eating local always better?

- New Zealand raised lamb
  - Pasture-raised
  - 11,000 miles by boat to UK
  - 1,520 lbs CO_2/ton
- UK raised lamb
  - Conventionally grown, feed-reliant
  - 6,280 lbs CO_2/ton



From study conducted at Lincoln University in New Zealand

Food Miles versus Lifecycle Assessment

- “Localism is not always the most environmentally sound solution if more emissions are generated at other stages of the product life cycle than during transport.”
  - Landcare Research Manaaki Whenua, A New Zealand Environmental Research Organization

Activity 3: Hidden Energy

Everyday Items have Carbon Footprints

Hidden Energy:
Secondary Carbon Footprints

- Observe the object in front of you.
- Use the poster paper and markers provided to draw/diagram the materials used to make, market, utilize and dispose of this object.

Hidden Energy

- Consider the following as you observe this object:
  - Raw materials
  - Manufacturing
  - Packaging, transport, and storage
  - Marketing
  - Use/Lifespan
  - Disposal

Hidden Energy

- Finally, indicate the steps on your diagram that use energy and result in CO_2 emissions.

Hidden Energy

- View your object from the perspective of the manufacturer: How can the carbon footprint of your object be reduced?
- View your object from the perspective of the consumer: How can the carbon footprint of your object be reduced?

Hidden Energy In the News

- "Wal-Mart asks Suppliers to Rate Energy Use"

  The Wall Street Journal, *September 24, 2007*

- 25 – 30 companies that supply products such as DVDs, toothpaste, soap, milk, beer, vacuum cleaners, and soda will be asked to measure the amount of energy used to manufacture their products.
- The company wants to cut packaging waste, increase fuel efficiency, and eventually operate entirely on renewable energy.

Hidden Energy
& The Informed Consumer

- Carbon Labeling
- Sustainability Ratings
- Eco-labels & Green Certification

Carbon Labeling

Whole Milk
Serving Size 8 fl oz (240mL)
Servings Per Container 2

Amount Per Serving	
Calories 150	**Calories from Fat** 70
	% Daily Value*
Total Fat 8g	12%
Saturated Fat 5g	25%
Cholesterol 35mg	12%
Sodium 125mg	5%
Total Carbohydrate 12g	4%
Dietary Fiber 0g	0%
Sugars 11g	

CARBON: 1 kg

Vitamin A 6% • Vitamin C 4%
Calcium 30% • Iron 0% • Vitamin D 25%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Sustainability Ratings

Carbon Facts

Product Size 1 Cheeseburger (130g)

Amount Per Serving	
Kilograms CO_2 Equivalent 3.08	
Kilograms CO_2 .243	Kilograms CH_4 .123
Total C: Energy Sources	243g
Transportation	
Fossil Fuel (Diesel)	120g
Fossil Fuel (Gasoline)	48g
Electricity Production	
Fossil Fuel (Natural Gas)	75g
Fossil Fuel (Coal)	0g
Other	
Total C: Non-Energy Sources	2840gCO_2E
Enteric Fermentation	81.0g (1864gCO_2E)
Manure	25.8g (656gCO_2E)
Other	5.2g (120gCO_2E)
Carbon/Product Ratio	23.7
Localism Rating	C+
Sustainable Production Rating	D+

overall carbon code: orange

Eco-Labels & Green Certification

Our Footprint Notre Empreinte

Environmental Impact Impact sur l'environnement

Energy to Produce: (per pair)*	2kWh
Énergie utilisée (par paire)*	2kWh
Renewable energy (Timberland-owned facilities):	5%
L'énergie renouvelable (sites appartenant à Timberland) :	5%

Community Impact Impact sur la communauté

Hours served in our communities:	119,776
Nombre total d'heures données :	119,776
% of factories assessed against code of conduct:*	100%
% d'usines évaluées pour leur conformité au code de conduite :*	100%
Child labor:*	0%
Main-d'oeuvre enfantine :*	0%

Manufactured Fabriqué à

Shingtak, China Shingtak, Chine

* metrics based on global footwear production for 2005
* informations fondées sur production totale de chaussures en 2005

FOR MORE INFORMATION VISIT WWW.TIMBERLAND.COM/CSRREPORT
POUR PLUS D'INFORMATIONS : WWW.TIMBERLAND.COM/CSRREPORT

Carbon Reduction Solutions

- Individual behaviors and consumer choices impact an individual's carbon footprint.

Acknowledgements

- ERP Staff
- Christie Hinson, Civic Education Consortium, UNC
- Terri Buckner, Office of Sustainability, UNC
- Z. Smith Reynolds Foundation

Contact Information

Dana Haine, Science Educator
Environmental Resource Program,
UNC Institute for the Environment
dhaine@unc.edu
(919) 843-5735