HOME ECOSYSTEM LAB

In this lab you will be asked to analyze data you collect on your household production of solid waste, water use, energy use, and food consumption. The class will be divided into three groups randomly: one studies water, the second studies energy, the third studies solid waste. Each group member will be responsible for completing the whole data collection sheet and submitting it to the instructor on the due date.

One person in each group summarizes the group's data in less than two minutes (give ranges and averages, but not names). Everyone in the group, including the summarizer, gives a 5-10 mini-lecture on a topic related to water, energy, or solid waste and that is relevant and interesting to the students in the class. Everyone is expected to be present during other groups' presentations.

When considering topics for each member to cover, pick topics that will be of interest to you, your group, and the rest of the class (most importantly). As a group, consider covering your topic at the personal, local, national, and global scales.

Suggestions for effective group presentations:

- Exchange names and phone numbers.
- Establish a group outline for the presentation as soon as possible and assign people to develop each section.
- Establish individual outlines and share these so that there is not overlap in presentation topics.

Initial sources of information include Tucson Water Dept., Tucson Electric Power Company, Tucson Clean and Beautiful.

Grades will be given on an individual basis: see Grading Rubrics in syllabus.
Participation at all class meetings is important and graded.

Your Group ____

Other Members: NAME CONTACT INFO

WORKSHEET FOR HOME ENERGY USE **NAME** ________________________________

INTRODUCTION

Certainly one of the big "stories" in the home ecosystem is told about energy. Energy comes into the ecosystem through a thick electric wire or a thin copper pipe in a form that can be readily utilized by our appliances and devices. Energy to be used to videotape a favorite program, wash our clothes, cool our food, or power the myriad of other energy-consuming events that form a background in the modern busy household. According to Gershon and Gilman (1992), 17% of all US energy is consumed by households. Along with that energy use comes about 8000 pounds of carbon dioxide per person and 15 pounds per person of smog and acid deposition.

Do we take such energy use for granted? Are appliances that could be run at lower energy-consumption levels casually run at higher levels? Are lights/appliances that could be turned off (= 0 energy consumption) left on for no real reason? Only you can answer these questions and the "nuts and bolts" quantitative questions about your home ecosystem energy consumption. Here's your chance!

Identify the energy-consuming devices in your home. Name the device and check whether it uses electricity or gas.

DEVICE	ELECTRIC	GAS
SPACE COOLING		
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________
SPACE HEATING		
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________
ENTERTAINMENT		
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________
COOKING		
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________
________________________	__________	__________

(Continued)

DEVICE	ELECTRIC	GAS
CLEANING		
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
WORK-RELATED APPLIANCES		
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
REFRIGERATOR/FREEZER		
______________________	__________	__________
______________________	__________	__________
PERSONAL CARE AND MAINTENANCE		
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
OUTDOOR MAINTENANCE		
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
OTHER (SPECIFY)		
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________
______________________	__________	__________

DON’T FORGET TO TURN THIS IN WITH THE LIGHT ANALYSIS!!

LIGHTING ANALYSIS

Identify and list below all lights in your home and the type of light (I = incandescent; H = halogen, CF = compact fluorescent, and LED = Light emitting diodes). Record the wattage for each light in column two (W) (note: if turning on a light switch turns on two 60-W bulbs, then record 120 watts). Record the amount of time each light is on for one week (in minutes initially and then divide by 60 to convert to hours) and divide the number of hours by the number of days (7) to determine average hours per day and record this calculation in the third column (H)(Note: 1 hour and 30 minutes = 1.5 hours, not 1.3 hours). Then calculate the last two columns. Finally, redo worksheet (next two page), "replacing" your lights with incandescent bulbs and then with compact fluorescent bulbs (see conversions).

YOUR BULBS

Your Light and type	Watts (W)	Hours/Day (H)	Kwh/Month (K) (WxHx30)/1000	Cost ($) Kx0.1
		TOTALS		

(Kwh X 1.5 = lbs of CO_2 produced) **CO_2 EMMISSIONS** ______________

INCANDESCENT BULBS

Different kinds of lights use different amounts of watts for the same amount of light. On this page, "convert" all your lights to **incandescent bulbs**, and recalculate.

Table 1. Equivalencies (in Watts)

Incandescent	100	75	60	40
Halogen	80	60	48	32
Compact Fluorescent	27	20	15	11
LED	18	11	7	5

Incandescent Light	**Watts (W)**	**Hours/Day (H)**	**Kwh/Month (K) (WxHx30)/1000**	**Cost ($) Kx0.1**

TOTALS ______________ _______

(Kwh X 1.5 = lbs of CO_2 produced) **CO_2 EMISSIONS** ______________

COMPACT FLUORESCENT BULBS

On this page, “convert” all your lights to compact fluorescent bulbs, and recalculate.

Table 1. Equivalencies (in Watts)

Incandescent	100	75	60	40
Halogen	80	60	48	32
Compact Fluorescent	27	20	15	11
LED	18	11	7	5

Fluorescent Light	Watts (W)	Hours/Day (H)	Kwh/Month (K) (WxHx30)/1000	Cost ($) Kx0.1
		TOTALS		

(Kwh X 1.5 = lbs of CO_2 produced) **CO_2 EMMISSIONS** ______________

POINTS TO CONSIDER IN YOUR PRESENTATION

Standard incandescent bulbs cost less and last less long; fluorescent bulbs cost more and last longer. Thus, depending on amount of use, switching to fluorescent bulbs may be a good return on investment when life-cycle cost (cost of bulbs + cost of energy over lifetime of bulbs) is calculated.

1. How much energy and CO_2 emissions could be saved by converting to fluorescent bulbs?
2. Compare lifecycle cost between incandescent and fluorescent bulbs (also try converting just the bulbs used most).