

# ECOSYSTEMS: A LIVING NETWORK

**W.W. KERN**

**Grade Level: 9**

**Time: 40 minutes**

**Theme:**

Man-Land Relationships

**Purpose:**

This lesson is based upon the Man-Land relationship theme that students see developing early in the course. It is part of the concept of balanced/non-balanced changes in ecosystems as related to human activity. The students have been exposed to and recognize that living things (including humans) need air, energy (food), water, and soil (space). They have explored air, energy and water. Soil/land use is the general topic and waste disposal is the specific. They have participated in a field-based activity that has shown them how surrounding counties handle their waste disposal.

**Objective:**

- To help students understand the interaction of culture and technology in the use, alteration and conservation of the physical environment. The student will recognize that civilization comes with a cost. The student will recognize that some costs are personal, some are social but all are environmental.
- To help the student utilize the appropriate vocabulary, geographical, reference/study, critical thinking, and decision making skills. The student will read and determine relationships described by line graphs and tables.

**Materials:**

- trash (not garbage)
- plastic gloves
- plastic dropcloth
- scale
- clipboard
- 3 x 5 index cards
- name tags
- markers

- Trashology forms (see 3<sup>rd</sup> page)

### **Procedures:**

1. Prepare by
  - A. Reviewing the field-based activity perceptions.
  - B. Questioning the students on their own contributions to the problem.
2. Perform "Trashology" experiment.
  - A. Student volunteer(s) bring in 1 day's trash (not garbage).
  - B. Sorter volunteers are appointed and given badges that designate their categories (glass, metal, paper, and plastic). Another volunteer mans the scale (the weight watcher) and one acts as a recorder.
  - C. Each sorter assembles and carries to the weight watcher, their specific category.
  - D. The weight watcher obtains the total mass of each category and informs the recorder, who writes the figure down on a "Trashology" form.
  - E. All students obtain the daily figures for each category and uses the appropriate math to figure the weekly, monthly and yearly amounts.
  - F. Students prepare a relationship graph based on the original measurements (daily figure).
  - G. Students categorize items as renewable or non- renewable.
  - H. The students are debriefed with questions that relate to:
    - i. personal consumption
    - ii. packaging methods
    - iii. personal waste disposal methods and costs
    - iv. public disposal methods and costs
    - v. alternative strategies, both personal and public
    - vi. effects on current and future population centers.

### **Closure:**

1. All students participate in the "Ecosystem Group Gathering" (EEG).
2. All students are assigned a title, by sequence, Air, Energy, Water or Soil.
3. All students will stand and form a tight circle, front to back.
4. All students slowly sit down on the knees of the person behind them and then stand up again.
5. The instructor selects a category to remove from the circle.
6. Without closing ranks, the remaining students attempt step 4 again.
7. If successful, another category leaves the circle (see step 5).
8. Upon collapse of the environment, ask the students why it collapsed. Answers should indicate that all parts must be present for survival.

## Trashology Exercise

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Hour: \_\_\_\_\_

	Paper	Plastic	Glass	Metal
Mass:	_____	_____	_____	_____

What period of time does the trash you are examining represent? \_\_\_\_\_

At the rate represented above, how much would this family accumulate in 1 week?

	Paper	Plastic	Glass	Metal
Mass:	_____	_____	_____	_____

How much would be accumulated in 1 month?

	Paper	Plastic	Glass	Metal
Mass:	_____	_____	_____	_____

How much would accumulate in 1 year?

	Paper	Plastic	Glass	Metal
Mass:	_____	_____	_____	_____

Make a graph that shows the relationship between the masses of each of the original measurements.

List all the items that come from renewable and non-renewable resources.