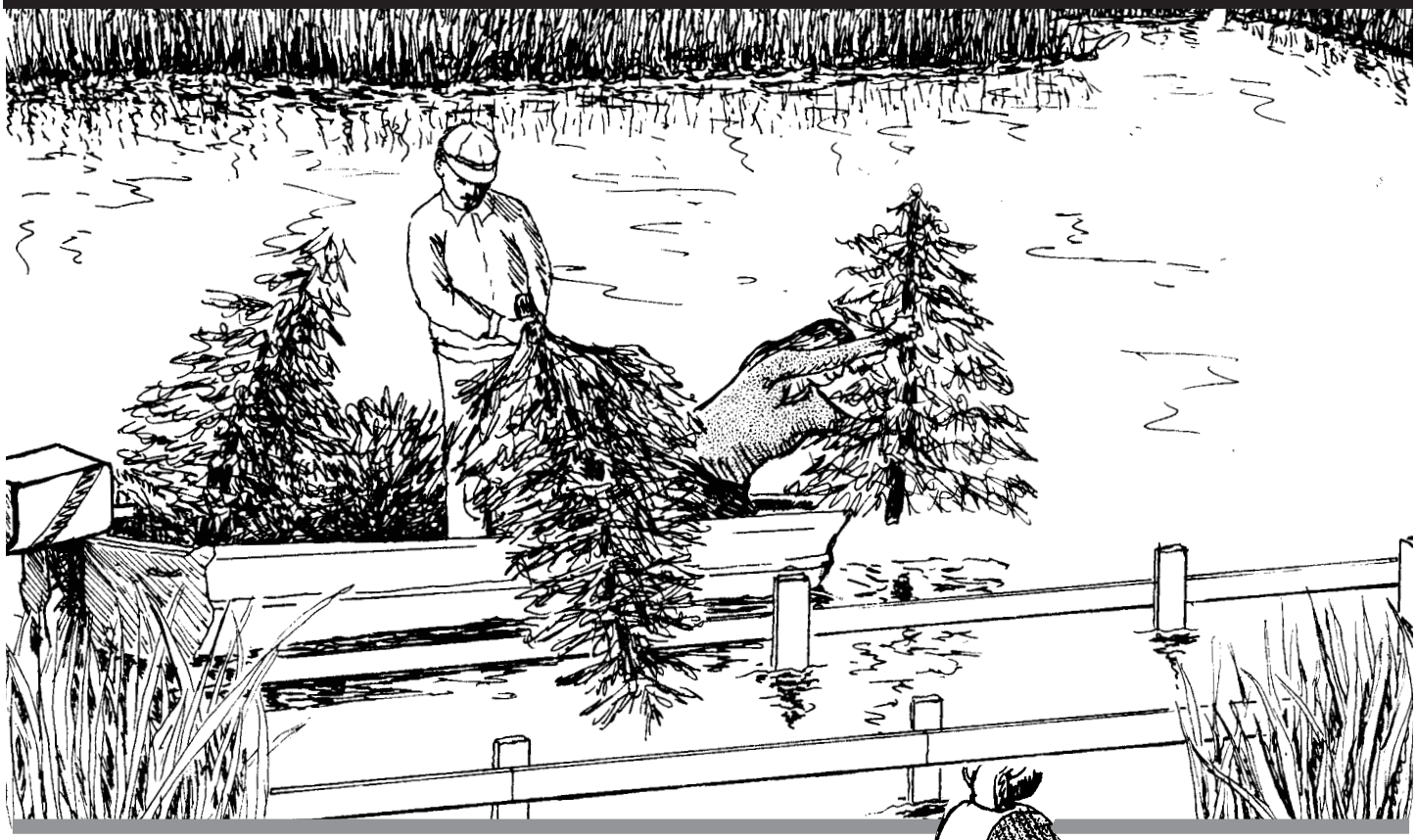
9. RESOURCE MANAGEMENT:
Land Use in and around the Lake Pontchartrain Basin



Chapter 9

Essential Questions:

What did my neighborhood look like 50 years ago?

Who owns the land, the air, and the water?

Should land use be determined by need or greed?

What will our descendants think of our role as stewards of the environment?

RESOURCE MANAGEMENT:
Land Use in and around the Lake Pontchartrain Basin

OBJECTIVES:

- List past and present land use practices in the Lake Pontchartrain Basin and understand their relationship to population size.
- Develop mapping and map reading skills as they apply to land use planning and resource allocation.
- Understand the relationship of cause and effect and to be able to accurately interpret graphs which contain land use and resource allocation data.
- Broaden our perspectives by assuming another's point of view regarding the value of a particular commodity (in this case, land use).
- Increase understanding of land use problems by researching and defending a point of view not necessarily the student's own.
- Develop the ability to construct rational arguments and to articulate them in a well thought-out manner.

MULTIPLE INTELLIGENCES LEARNING ACTIVITIES:

Verbal/Linguistic: Develop verbal skills by interviewing wetland residents for background information in preparation for a jury trial. Develop the ability to convincingly defend one's personal point of view by posing as "expert witnesses" during courtroom proceedings.

Interpersonal: Participate in a "courtroom" drama which will unfold using role playing techniques and draw upon the specific knowledge of witnesses from all sides of current land use problems.

Logical/Mathematical: Interpret maps and GIS (Geographic Information Systems) data. Construct and defend logical arguments.

Bodily/Kinesthetic: Dramatic reenacting of courtroom proceedings - use of supplemental charts and diagrams as "evidence".

Naturalist: Make observations about maps, aerial photography, and natural habitats; check the accuracy of the map-maker's work.

UNDERSTANDING LAND USE PRACTICES
- A Map Reading and GIS Exercise -

Procedure:

1. Duplicate and distribute copies of Worksheet 1 *(Page 231)* and the associated GIS map(s) in Appendix A. Transparencies of the worksheets and maps work well as teaching aids.

2. Begin by reading items from the section entitled "Notice" to the students (Worksheet 1). Promote discussion by exploring the possible relationships of map-related questions to the ideas listed under the section entitled "Consider" and by suggesting avenues available for further research ("Research"' section).

3. Encourage students to further explore topics related to maps and land use considerations by showing them examples of "starting points" which the educator has already located and/or obtained from the library. Outline possible directions to take when attempting literature searches in the library (e.g., periodicals, journals, books, non-print media, Internet resources).

The term "land use" refers to the many possible ways in which we manipulate our environment by using natural resources. For example, land use practices can be understood as the many ways in which we use land; agricultural areas, natural (undisturbed) areas, parks, urban areas, etc.

[Please refer to Appendix A for GIS (Geographic Information Systems) maps]

GIS maps can be used to graphically illustrate a number of pertinent features about a given geographic area. These data are graphically over-laid upon an existing map and "locked-down" by geo-referencing the data to a specific latitude and longitude. Some examples of data geo-referenced to area maps are: Vegetation patterns (distribution and types), Land use patterns (agricultural vs. urban vs. wetlands, etc.), Temperature gradients, Soil characteristics, Various urban characteristics (e.g. streets, power grids, voting districts, economic distribution, etc.)

"Land use" also refers to the particular strategy an individual or group of individuals applies to the utilization of natural resources. One might consider the land use practices of a nomadic people to be low-impact and self-sustaining, as is usually the case. On the other hand, a highly industrialized society often uses natural resources with an avariciousness sometimes bordering upon the absurd... as if natural resources will never be completely consumed, or that the problem can be dealt with by later generations.

WORKSHEET 1: GIS AND MAPPING SKILLS

NOTICE	CONSIDER	RESEARCH
■ How the different patterns or colors represent different types of land.	■ How did we "look at" and evaluate land use patterns before computers allowed us to manipulate these kinds of data?	■ Look up Geographic Information Systems and their role in urban planning.
■ How different types of land are located in relation to other land types (e.g., urban and agricultural).	■ Is there a pattern associated with the way one land type is placed next to another?	■ The role GIS plays in future planning of cities and the protection of and maximization of wildlife areas.
■ How certain types of land are located directly adjacent to rivers, lakes and streams.	■ Is there a reason for this? Does the placement of urban areas next to wetlands affect the wetlands? Does the placement of *created* wetlands next to urban areas affect the urban areas? Positively? or Negatively?	■ The degradation of natural areas by urban runoff and the filtering of such runoff by created wetlands.
■ How the urban areas encroach over the years upon the wetland areas.	■ Does this encroachment affect the wetlands and its plants and animals?	■ Why wetland plants and animals live precisely where they do and nowhere else... ***could*** wetland plants and animals live or move to another home?

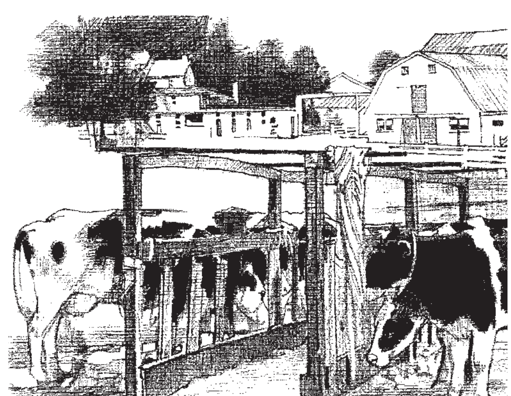
Let's consider our own society, and even more specifically, our own region of the state. As one can see from the GIS maps, land use patterns in the Lake Pontchartrain Basin have changed dramatically from the 1950s to the 1990s.

WHY DO YOU SUPPOSE LAND USE PATTERNS HAVE CHANGED SO MUCH?

WHAT ARE THE MOST NOTICEABLE CHANGES THAT HAVE OCCURRED DURING THIS TIME PERIOD?

HOW DO YOU THINK THE CHANGES IN THE AMOUNT AND KINDS OF LAND WE NOW HAVE AFFECT POLLUTION LEVELS IN THE LAKE PONTCHARTRAIN BASIN AND, AS A DIRECT RESULT, OUR OVERALL ENVIRONMENTAL QUALITY?

Most libraries will contain excellent resources to use as a starting point for further exploration of this topic, both in traditional books and journals as well as Internet publications. Keywords for searching are: land use, conservation biology, resource management, GIS (Geographic Information Systems), human population ecology, and population explosion.



"We abuse land because we regard it as a commodity belonging to us."

Aldo Leopold
(ecologist and founder of modern conservation biology theory)

There is undeniably one single, dominant cause directly responsible for the drastic changes in our land use practices and hence the environmental quality of our surroundings.

POPULATION SIZE.

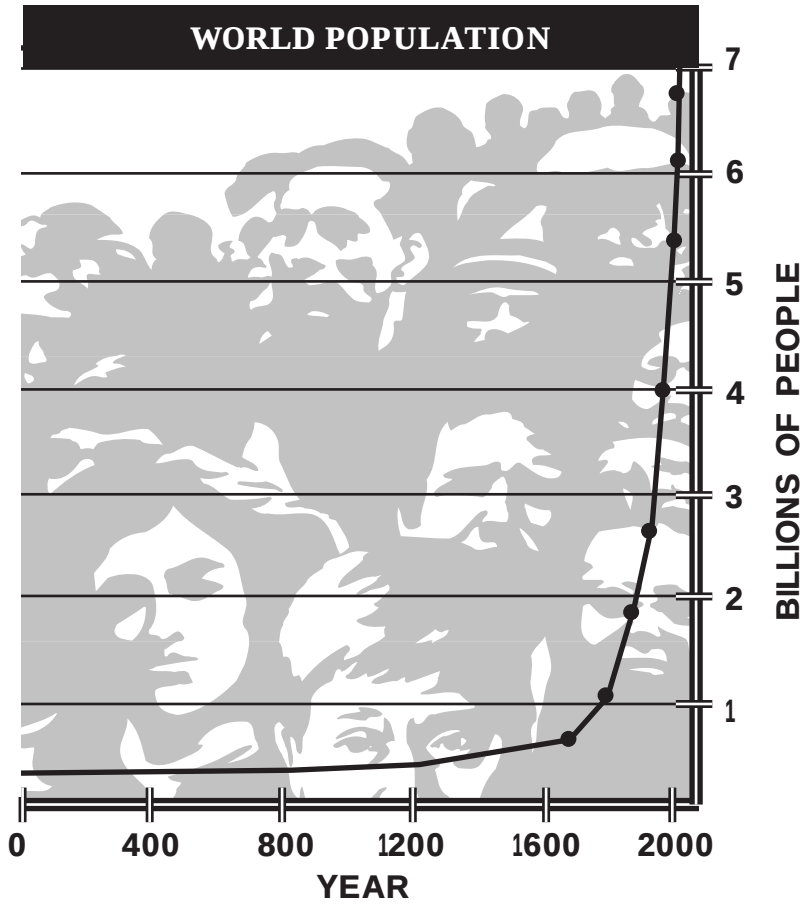
Think about it. ***When our population was relatively small, say back before European settlers came to Louisiana, there was virtually no pressure upon our ecosystems. Native peoples took only what they needed and managed to live harmoniously with their surroundings. As people began to settle down and live in groups, cities like New Orleans were founded. The need to convert nearby land to agricultural and livestock farms grew as the demand for these products increased. Pressure on the environment also increased. Still, there were few enough people and enough land around them to serve as a buffer zone that no appreciable impact was felt. From the mid 1700s until the mid 1800s (the onset of the Industrial Revolution in the U.S.) the population began to rise at a much faster rate. After World War II, sudden and dramatic developments in technology allowed an unheralded increase in population size. This worldwide increase in population has resulted in wholesale changes to, and unprecedented pressures upon, our remaining natural areas.***

An excellent population explosion resource for teachers can be found in the video "Zero Population Growth" which has a total running time of only 7 1/2 minutes. Available through Zero Population Growth Foundation.

"When we begin to see land as a community to which we belong, we may begin to use it with love and respect."

Aldo Leopold

The global population increase over time is depicted graphically in the chart below.



Adapted from: Meserovic, Mihajlo, and Eduard Pestel. (*1974). Mankind at the Turning Point :The Second Report to the Club of Rome. New York: Signet.*

While we are still on the upslope of this dramatic curve, and may have a little breathing room, to procrastinate and assume that things will get better on their own is to court disaster. Many experts feel that the sooner we act, the less severe will be our (or our descendants') recovery from the inevitable ecological collapse.

? DOES THERE NEED TO BE AN ECOLOGICAL COLLAPSE? ?

? CAN OUR DESCENDANTS RECOVER WITHOUT SUFFERING TOO MANY HARDSHIPS OR LIVING UNDER A DRAMATICALLY DECREASED STANDARD OF LIVING? ?

? WHAT WILL OUR DESCENDANTS THINK OF OUR role AS STEWARDS OF THE ENVIRONMENT? ?

? WILL OUR DESCENDANTS PRAISE OUR EFFORTS? OR CURSE OUR INADEQUACIES? ?

LAND USE PRACTICES IN THE LAKE PONTCHARTRAIN BASIN

"...although the Earth takes care of the needs of men, it cannot take care of the greeds of men..."

Mahatma Gandhi

This quotation from the great Hindu social reformer brings to mind the very crux of our current land use dilemma. If our population levels had remained small, there would be an abundance for all and human impacts upon the environment would have remained minimal. As population levels grew, however, some saw that the natural resource "pie" was being divided into ever smaller pieces and decided that the time was right to claim for themselves a larger "slice". This frantic scrambling for resources has triggered a vast array of land use problems... most of them brought about by the desire to exploit a single aspect of our natural resources at the expense of others. There are, of course, many complicated issues involved with the land use controversy.

FOR EXAMPLE,

let us consider the single issue of resource management and allocation in the Lake Pontchartrain Basin:

- How far out in the Gulf of Mexico do Louisiana's or America's fishing or mineral rights extend?
- Who deserves the benefits of a particular forest on the North Shore: the timber company who owns the land and wants to log it, or the people who live downstream and will suffer greatly reduced water quality and increased flooding if the trees are removed?
- If someone owns the rights to underground minerals and wants to mine them, what is their responsibility in preserving the ecological integrity of the surface area?
- Does a farmer on the North Shore have a responsibility to see that the pesticides and fertilizers he or she uses do not interfere with the environment downstream of his land?
- Who owns "state-owned" wetlands and other natural areas? Can the state lease them out without consulting all of us?

These questions and many more like them can form the basis for a number of individual classroom exercises. A convenient format for the presentation of land use topics can be found in the preceding exercise where a worksheet was used to analyze questions and promote further study (Worksheet 1, page 231). In the following exercise (Worksheet 2, page 237) a similar format is used to explore the loss of wetland ecosystems due to land use problems. In Worksheet 2 only a single column of information is filled in. Encourage your students to complete the worksheet by supplying ideas for the columns entitled "Consider" and "Research".

THE LOSS OF WETLAND ECOSYSTEMS IN THE LAKE PONTCHARTRAIN BASIN ASSOCIATED WITH POPULATION INCREASES

Procedure

1. Reproduce the 1950 and 1990 maps of wetland loss located in Appendix A.

2. Reproduce the page outlining a few questions related to resource allocation and land use problems surrounding the Lake Pontchartrain Basin *(Worksheet 2, Page 237)*.

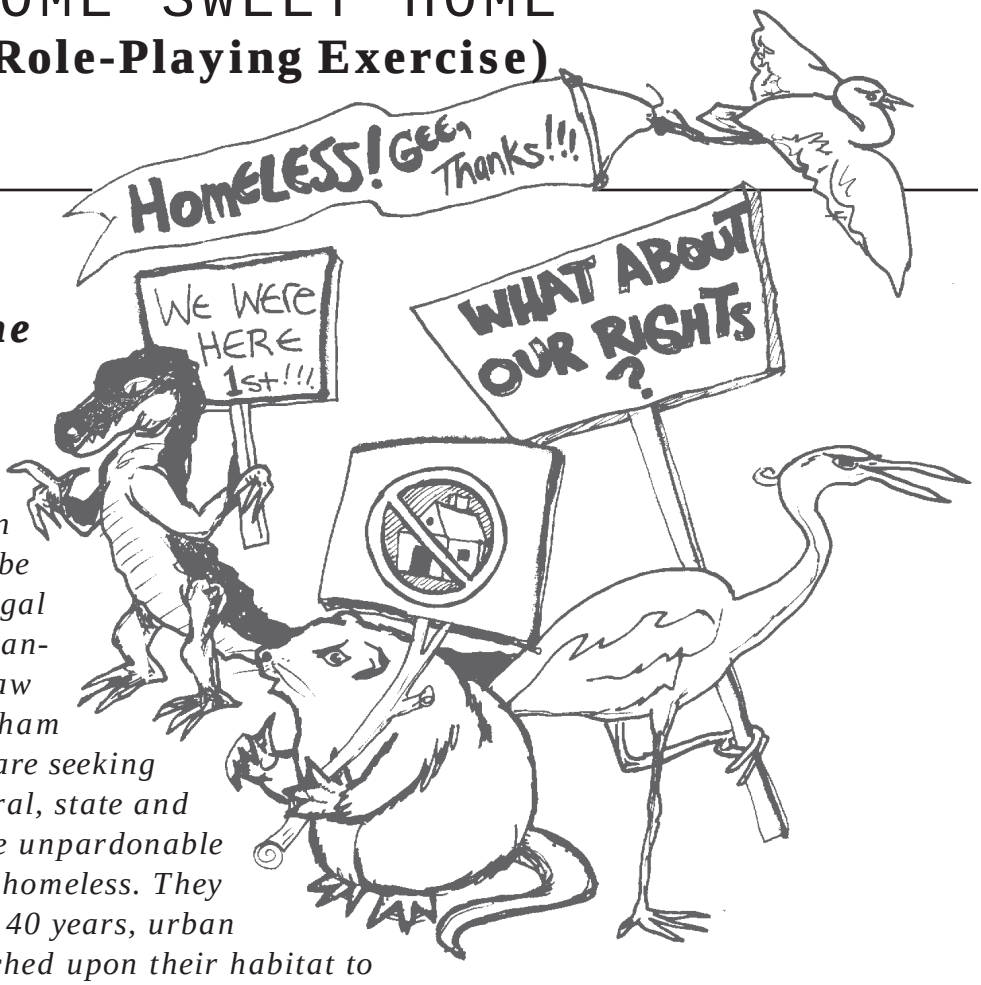
It becomes apparent from comparing these two maps that the wetland losses in the Lake Pontchartrain Basin are associated with very specific aspects of the population increases our region has experienced in the past 40 years. As the population rose, the wild areas surrounding the population growth decreased. Use the worksheet to explore some of the topics associated with this dramatic loss.

WORKSHEET 2: Resource Management and Allocation- Wetland Loss

NOTICE	CONSIDER	RESEARCH
■ Where did the wetlands go?		
■ How are the particular functions of these wetlands carried out now that there are fewer wetlands in the Lake Pontchartrain Basin?		
■ Are these functions carried out? If not by wetlands, how could these functions otherwise be accomplished?		
■ Where did the animals who lived in these wetlands go?		

HOME SWEET HOME
(Role-Playing Exercise)

Introduction:



Excerpted from today's issue of the <u>Daily Times</u>:

"A large group of wetland animals marched this morning on City Hall demanding to be heard.... Their current legal representation is being handled by the prestigious law firm of Boyd, Duhe, Conham and Stihl. The animals are seeking restitution from the federal, state and local governments for the unpardonable crime of rendering them homeless. They claim that, over the past 40 years, urban development has encroached upon their habitat to the extent that they no longer have a suitable place to live. Herons, egrets, nutria and alligators are currently residing along suburban canals seeking what little refuge and sustenance are available. Other residents have been forced to move from their ancestral homes and relocate or die of exposure to the elements."

"A trial date has been set for next Wednesday to evaluate the plaintiffs' demands and will be presided over by the honorable Judge N. St. Cyr, fifth circuit court. The defense counsel maintains that these animals are complaining out of turn, that they are lazy, good-for-nothing bums who would rather loaf about near canals than work to earn a decent living. The district attorney's office, who is handling the defense, also contends that the needs of humans take precedence over those of mere 'swamp animals' and therefore the urbanization process is one of progress, not one of retrogression."

Preparation:

(The educator should tailor the exercise to apply to the students' home parish)

Note: *This exercise can be performed in multiple ways. The teacher can provide students with the background materials (life history traits) on each animal and treat the exercise as a simple role-playing game. The teacher can provide the reference materials necessary for the students to locate the facts for themselves during a class period devoted to research, or the fact-gathering can be assigned as a homework assignment.*

1. Read the "newspaper article," and write the following problem statement on the board.

Problem Statement:

Thousands of animals have been made homeless by the rapid development of urban areas which take over wetland habitat.

2. Randomly assign roles to the students to play in the courtroom drama:

- Judge *(1)*
- Defense Attorneys, Prosecuting Attorneys
- Jury *(12)*
- Expert Witnesses *(one for each type of animal)*
- Detectives who research for the attorneys
- The remaining students can represent townspeople divided to represent pro and con viewpoints.

3. Make copies of and distribute data sheets *(Pages 240-241)* to students. These are to be used as tools for gathering information on the life history traits of wetland animals as well as information sheets for the attorneys to use during the ensuing trial.

4. Allow students to begin an independent fact-gathering and strategy-planning period. Students should keep the role they are playing in mind, and attempt to tailor their responses and strategies to their particular role.

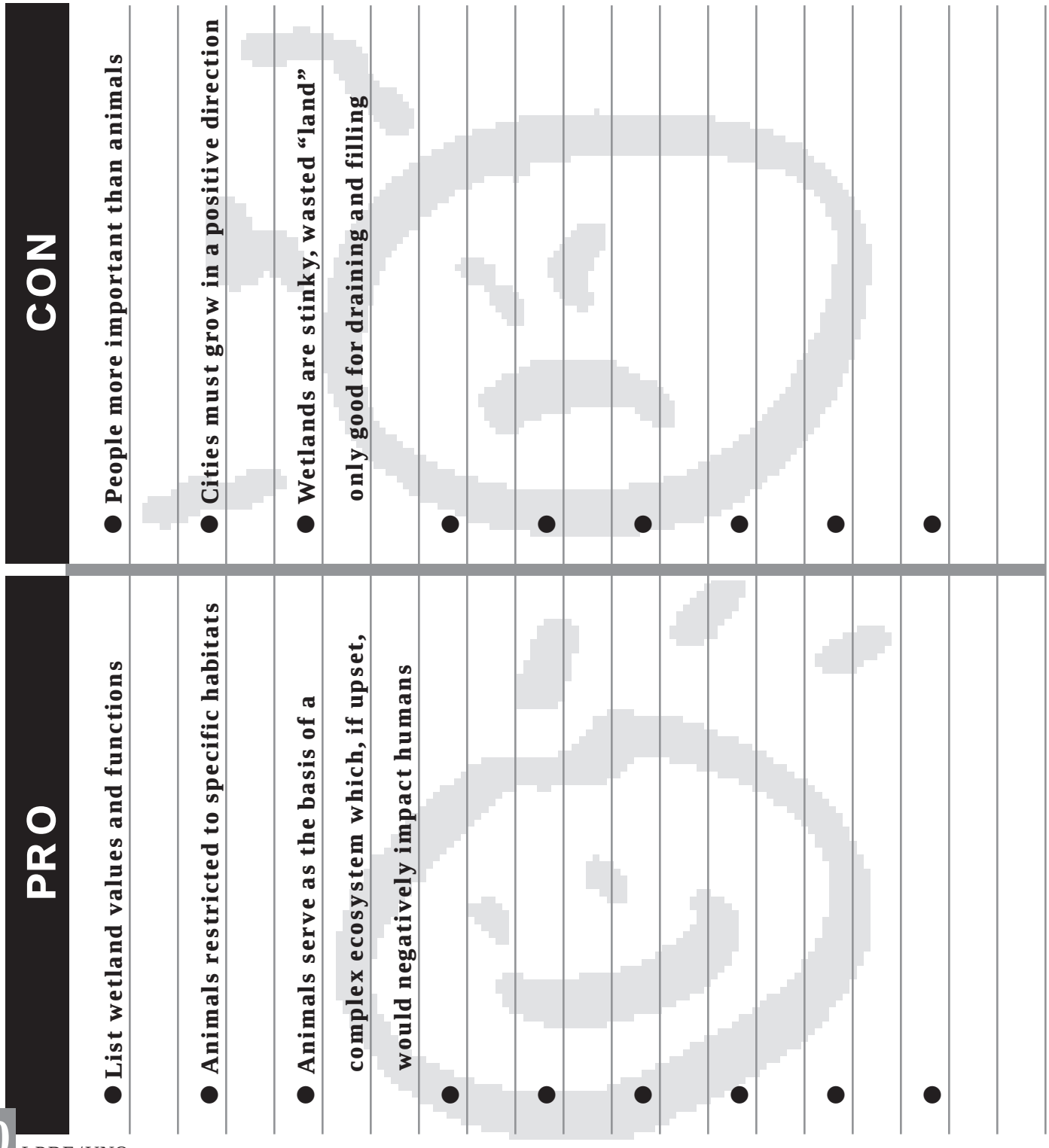
5. Arrange classroom to represent a courtroom: single chair up front for the judge, twelve chairs to one side for the jury, etc.

DATA SHEETS FOLLOW

DATASHEET 1

Sample research topics pertaining to the attitudes of townspeople

PROBLEM:
A multitude of wetland animals have been made homeless by humans who feel it is their right to develop such land for their own uses.



DATASHEET 2

EXPERT WITNESSES
(animal life history traits)

ANIMAL NAME _____

HABITAT REQUIREMENTS _____

_____

_____

_____

_____

_____

FOOD REQUIREMENTS _____

_____

_____

_____

_____

FORMER RESIDENCE _____

_____

_____

CURRENT RESIDENCE _____

_____

_____

NOTE HINTS:
Can animal survive in its current habitat? Can it survive on different foods? Why are wetlands important to this animal?