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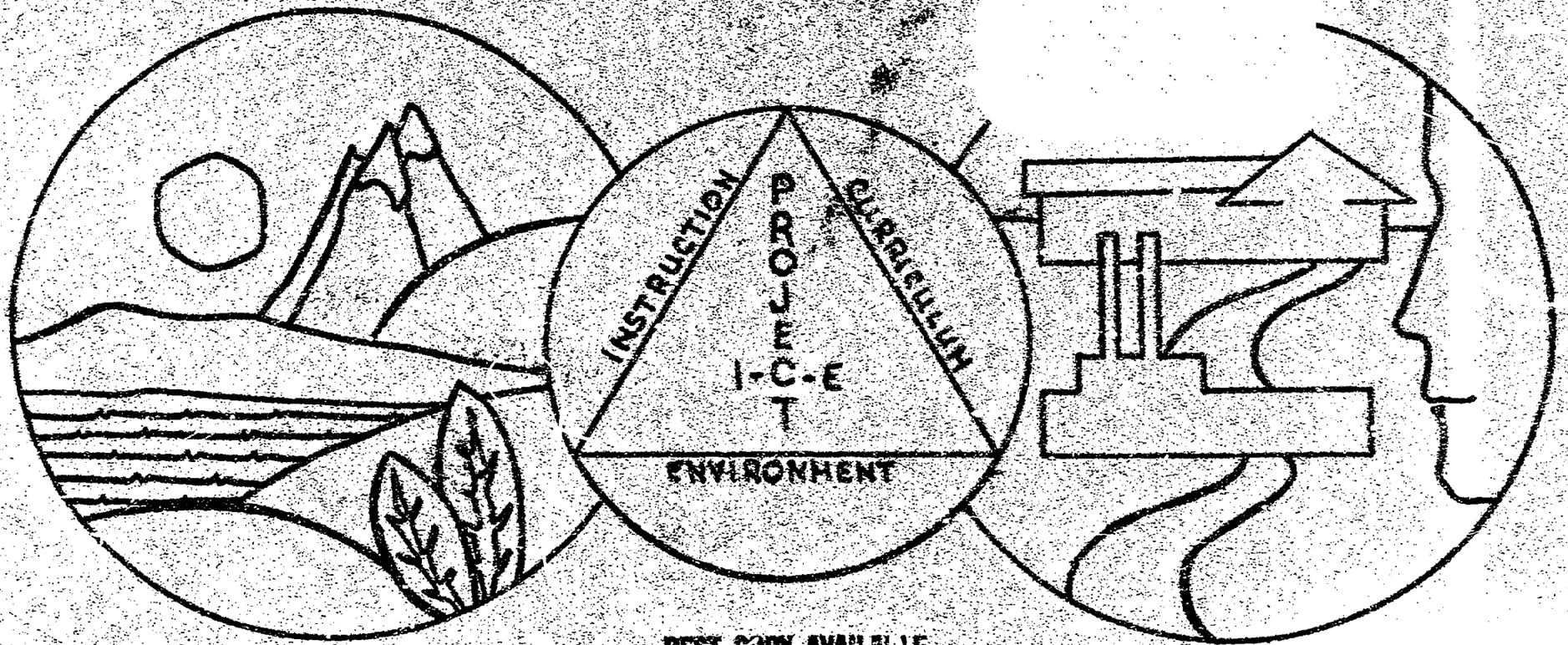
ABSTRACT

This agriculture guide, for use at the secondary level, is one of a series of guides, K-12, which were developed by teachers to help introduce environmental education into the total curriculum. Environmental problems are present i every community where agriculture education is offered, and therefore many agriculture teachers have included some environmental concepts in their curriculum. This supplementary guide is designed to serve as a basis for inclusion of major environmental concepts within the agriculture curriculum. The guide contains a series of episodes which are built around 12 major environmental concepts that form a framework for each grade or subject area, as well as for the entire K-12 program. Although the same concepts are used throughout the K-12 program, emphasis is placed on different aspects of each concept at different grade levels or in different subject areas. The agriculture guide focuses on aspects such as crop rotation, pesticides, and woodlot managements. The 12 concepts are covered in one of the episodes contained in the guide. Further, each episode offers subject area integration, subject area activities, interdisciplinary activities, cognitive and affective behavioral objectives, and suggested references and resource materials useful to teachers and students. (Author/TK)

SE 018 330

ENVIRONMENTAL EDUCATION GUIDE



AGRICULTURE

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PROJECT I-C-E TWELVE MAJOR ENVIRONMENTAL CONCEPTS

1. The sun is the basic source of energy on earth. Transformation of sun energy to other energy forms (often begun by plant photosynthesis) provides food, fuel and power for life systems and machines.

2. All living organisms interact among themselves and their environment, forming an intricate unit called an ecosystem.

3. Environmental factors are limiting on the numbers of organisms living within their influence. Thus, each ecosystem has a carrying capacity.

4. An adequate supply of clean water is essential to life.

5. An adequate supply of clean air is essential for life.

6. The distribution of natural resources and the interaction of physical environmental factors greatly affect the quality of life.

7. Factors such as facilitating transportation, economic conditions, population growth and increased leisure time influence changes in land use and population densities.

8. Cultural, economic, social, and political factors determine man's values and attitudes toward his environment.

9. Man has the ability to manage, manipulate and change his environment.

10. Short-term economic gains may produce long-term environmental losses.

11. Individual acts, duplicated or compounded, produce significant environmental alterations over time.

12. Each person must exercise stewardship of the earth for the benefit of mankind.

A "Concept Rationale" booklet and a slide/tape program "Man Needs His Environment" are available from the I-C-E RMC to more fully explain these concepts.

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PREFACE

Vocational agriculture/agribusiness and environmental science are interrelated areas of study. Whether we have recognized the fact or not we have been including many of the various concepts of environmental sciences in our individual curriculums for many years. No doubt many agriculture teachers have included some of the environmental concepts included in this I-C-E Guide, but probably most have not included instruction in all of the areas. This I-C-E Guide is intended to serve as a basis for inclusion of all of the environmental concepts contained within. It is hoped that each individual instructor will integrate this material as a unit or in parts in his present curriculum. It is a common practice that agricultural programs be adapted to local communities and needs. Environmental problems are present in every community where agricultural instruction is offered. Being that agriculture is the nation's largest consumer and converter of energy, it is our obligation to do our part in creating an awareness of the environment in our students and the public.

DIRECTIONS FOR USING THIS GUIDE

This guide contains a series of episodes (mini-lesson plans), each containing a number of suggested in and out of class learning activities. The episodes are built around 12 major environmental concepts that form a framework for each grade or subject area, as well as for the entire K-12 program. Further, each episode offers subject area integration, multi-disciplinary activities, where applicable, both cognitive and affective behavioral objectives and suggested reference and resource materials useful to the teacher and students.

1. This I-C-E guide is supplementary in design--it is not a complete course of study, nor is its arrangement sequential. You can teach environmentally within the context of your course of study or units by integrating the many ideas and activities suggested.

2. The suggested learning activities are departures from regular text or curriculum programs, while providing for skill development.

3. You decide when any concepts, objectives, activities and resources can conveniently be included in your unit.

4. All episodes can be adapted, modified, or expanded thereby providing great flexibility for any teaching situation.

5. While each grade level or subject area has its own topic or unit emphasis, inter-grade coordination or subject area articulation to avoid duplication and overlap is highly recommended for any school or district seeking effective implementation.

This total K-12 environmental education series is the product of 235 classroom teachers from Northeastern Wisconsin. They created, used, revised and edited these guides over a period of four years. To this first step in the 1,000 mile journey of human survival, we invite you to take the second step--by using this guide and by adding your own inspirations along the way.

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INDEX OF PROBLEM ORIENTATION TO ENVIRONMENTAL CONCEPTS

Topic/Unit

Concept	Soil Science	Plant Science	Animal Science	Farm Economics
	7 (page no.)	33	57	81
1	Organic Matter	Sun Energy	Dependence of Animal on Photosynthesis	Fuel Use Economics
	9	35	59	83
2	Life In Soil	Crop Rotation	Rumen Bacteria	Specialization vs. Diversification
	11	37	61	85
3	Carrying Capacity	Plant Population	Stress of Population on Environment	Cropping Plans
	13	39	63	87
4	Soil Water Conservation	Water Conservation	Water Supply Animal Waste Disposal	Farm Water Supply
	15	41	65	89
5	Air Pollution Soils	Air Pollution	Vent. of Livestock Structures	Farmstead Planning
	19	43	67	91
6	Soil Productivity	Crop Geography	Cow to Roughage vs. Roughage to Cow	Marketing Problems
	21	45	69	93
7	Land Use Competition	Land Use & Food Production	Meat Consumption	Zoning Ordinances
	23	47	71	95
8	Soil Appreciation	Pesticides	Vegetable vs. Animal Foods	Government Aid to Farmers
	25	49	73	97
9	Pesticides	Plant Pests	A. I. vs. Natural Breeding	Rural Sociology & Urban Relationships
	27	51	75	99
10	Soil Productivity	Woodlot Management	Woodlot Grazing	Land Use
	29	53	77	101
11	Animal Waste Handling	Cropping Practices	Animal Mistreatment	Marketing
	31	55	79	103
12	Soil Stewardship	Cropping Practices	Animal Wastes	Land Ownership

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 1 - Energy **SUBJECT** Agriculture

ORIENTATION Organic Matter **TOPIC/UNIT** Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain how energy from the sun is stored in the form of organic matter in the soil.

Explain how the carrying capacity of a soil is dependent on the organic level in the soil using examples to illustrate the relationship.

Affective:

Indicate awareness of the dependence of living organisms on the stored energy preserves within the soil by:

a. Stating the importance of organic matter for living organisms.
b. Responding positively when asked if stored energy is needed by living organisms.

Skills Used:

1. Have soils tested for fertility.
2. Study soil analysis reports.
3. Compare fertility levels of low and high organic content soils.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. The soil carrying capacity is dependent on the relative organic levels in that soil.
   1. Study corn population and yield potential per acre.
   2. Compare forage crop yields on fields of different organic levels.
B. Study photosynthesis area of plants. How the increased area will effect organic matter accumulation.

Outside or Community:

A. Find location of muck farms and identify crops grown on them.
B. Compare rate of growth of plants in shade to that of plants in open sunlight.
   1. Study shade tolerance of various plants.
   2. Compare maple tree and pine tree seedling growth rate in shaded forest.
C. Compare soil organic levels that were formed by centuries of open grasslands with that formed under a forest cover.
D. Have students study various ways of conserving barnyard manure and report to class.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Soil Use and Improvement, Stallings, J.H., Prentice-Hall Profitable Management of Wisconsin Soils, Walsh, L.M., Beatty, M.T. Profitable Soil Management, 3rd ed., Knuti, Korpi & Hide, Prentice-Hall **Audio-Visual:** Film: Conserving Our Soil Today, BAVI, #5079 **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

CONCEPT NO. 2 - Ecosystem

ORIENTATION Life in the Soil

Integrated with:

SUBJECT Agriculture

TOPIC/UNIT Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Demonstrate a procedure indicating that soil contains life in the form of microorganisms and earthborn insects.
Describe the locations of microorganisms and earthborn insects usually found in the soil.
Explain ways that microorganisms and earthborn insects improve soil.

Affective:

Find evidence that organisms help plants by releasing elements from soil and air.

Skills Used:

1. Inoculation of seed with nitrogen fixation bacteria.
2. Follow the earthworm's habits in forming, aerating and conditioning soil.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Study module formations on roots of legumes inoculated with nitrogen fixation bacteria.
B. Compare nitrogen levels of soils not inoculated, with inoculated soils, by tests.
C. Study ways the earthworm improves soil. Examples: percolation, water holding capacity, aeration

Outside or Community:

A. Collect inoculated seed tags and labels from farms and seed suppliers.
B. Collect and display seed and soil inoculants used by farmers in your community.
C. Demonstrate greenhouse plots of legumes grown in soils inoculated and soils not inoculated.
D. Demonstrate plant growth in potted sterile soil and fertile soil. Sterilize soil by baking at high temperatures.
E. Make a count of the earthworms and insects in a cubic foot of forest or garden soil and estimate their weight and numbers per acre.
F. Find soils that support large populations of earthworms. Study its quality and fertility.
G. Field trip to various soil types emphasizing life in the soil.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Management of Wisconsin Soils, Beatty, M.T. and Walsh, L.M., 1967 Profitable Soil Management, Knuti, Korpi and Hide **Audio–Visual:** Soybean roots - inoculated and non-inoculated specimens. Inoculant mixed with humus compost specimens. Specimens may be purchased through seed suppliers. Ecology and Agriculture Multi-Media Set, Ecology and the Ag. Environment, Vocational Ed. Productions, San Luis Obispo, California 93401 **Community:**	

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Environmental:

Integrated with:

CONCEPT NO. 3 - Carrying Capacity

SUBJECT Agriculture

ORIENTATION Zoning Soils for Agricultural Uses

TOPIC/UNIT Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Provide or select examples of situations that show that soils with very low moisture and fertility capacity will not be productive in yielding agricultural crops.
Explain the importance of zoning land for uses such as farming, recreational, etc. based on characteristics of temperature, soil type and moisture conditions.

Affective:

Appreciate that all land has a potential of producing a useful commodity though not all can produce the same commodity but suggesting alternate uses for a given area under differing conditions.

Skills Used:

1. Soil classification
2. Judging soils

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Soil types
   1. Study soil types, classification and their potential.
   2. Study of soil types suitable for crop production.
B. Assign student projects in selecting and zoning recreational lands.
C. Assign students research on zoning land for agricultural use based on soil maps and land capability classes.
D. Have students study an actual SCS Conservation Farm Plan Program and learn how production and management practices can be identified in regard to the potential carrying capacity of the land.

Outside or Community:

A. Field trip to farms or school land laboratory.
B. Consult area resource development department for zoning ordinances in a given township or community.
C. Have students research zoning ordinances of a given city.
D. Sponsor soil judging competition between students.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Soil Management, Knuti, Korpi and Hide Wisconsin Soils, Walsh, L.M. and Beatty, M.T., 1967 Soils, Worthen & Aldrich **Audio–Visual:** Make a soil profile of area soils **Community:** Community resource development agent, Ag. extension department	

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Environmental: **Integrated with:**

CONCEPT NO. 4 - Water **SUBJECT** Agriculture

ORIENTATION Soil Water Conservation **TOPIC/UNIT** Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain how water runoff from farm lands causes muddy streams and lakes.

Describe and demonstrate three procedures that are effective in reducing runoff.

Affective:

Appreciation of soil water conservation practices by making statements such as "That's good for reducing erosion" when viewing a field using strip cropping, terraced waterways, etc.

Skills Used:

1. How to improve water-holding capacity of soil.
2. How to build a water-holding pond.
3. How to build water terraces on slopes.
4. Soil percolation test.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Students to show water-holding capacity capabilities by use of a small flat of soil set up on a slope. Make use of sod, grass clippings. Rain and water flow can be simulated with the use of cans pierced with various size holes. When filled with water, they will simulate rainfall. The following can be shown:
   1. Mulching soil increases water absorption.
   2. Adding organic matter to soil increases water-holding capacity.
   3. Improved tilth of soil increases water-holding capacity.

B. The study of water conservation practices used on farm land.
   1. Water-holding ponds
   2. Terracing land
   3. Contour strip cropping
   4. Crop rotation builds soil organic content
   5. Winter cover crops hold snow in place for spring absorption.

Outside or Community:

A. View farm pond locations.
B. Draw plans for water ponds.
C. Visit land locations where terracing or contour cropping is practiced.
D. Conduct percolation testing of soil.
E. Survey farms using manure storage in place of direct spreading during winter.
   1. Study the merits of manure storage systems over direct spreading during the winter season.
   2. Study findings on agricultural fertilizer, manure and agricultural chemical field runoff and its effects on water pollution.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Soil Uses and Improvement, Stallings, J.H., Prentice-Hall Profitable Soil Management, Knuti, Korpi and Hide **Audio-Visual:** Ecology and Agriculture Multi-media Set, Water and the Ag. Environment, Vocational Education Productions, San Luis Obispo, California 93401 **Community:**	

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Environmental: **Integrated with:**

CONCEPT NO. 5 - Air **SUBJECT** Agriculture

ORIENTATION Wind Erosion Affecting Air Quality; Air Pollution Affecting Soils **TOPIC/UNIT** Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain why an adequate supply of clean air is essential to living things.
Explain ways that wind erosion can be controlled.
Compare the four ways of controlling wind erosion in terms of:
a. cost
b. available farm land
c. time required
d. effectiveness

Affective:

Accept the fact that air can be, and is, changed by land management and urban air pollutants and that air in turn does affect the soil in the local community without dissent.

Skills Used:

1. How to plant a windbreak to help conserve soil.
2. To identify potential areas of land susceptible to wind erosion.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Study history of "Dust Bowl" in the U. S.
B. Book, magazine or actual reports on instances of air pollution affecting the surrounding soil and farming conditions.
C. Study methods of wind erosion control:
   1. Windbreaks
   2. Cover crops
   3. Stubble mulching
   4. Shelter belts
D. Have students plant grain seeds on soil to which sulfur dioxide has been added and compare growth with a control plot.
E. Initiate discussion on "spray drift" and who is responsible for this practice.

Outside or Community:

A. Plant conservation trees for windbreaks and in sand dune areas.
B. Take a field trip to areas affected by wind erosion and study the practices used there.

SUGGESTED RESOURCES

Publications:

Profitable Soil Management, Knuti, Korpi and Hide

Audio-Visual:

Film:
Conservation to Save Our Environment, BAVI, #7813

Filmstrips:
Ecological System, Imperial Film Co., ICE RMC, FS St 19
Conserving Our Natural Resources, Encyclopedia Britannica Films, ICE RMC, FS St 22

Community:

Have soil conservation man come to class and discuss wind erosion

CONTINUED OR ADDED LEARNING ACTIVITIES

ORGANIC LIVING: Soil - Nature's 'Mr. Clean'

Of all the resources we depend on to support life, soil is the most important. The National Wildlife Federation, in producing its 1972 Environmental Quality Index, determined that soil accounted for 30% of the total environmental picture. Air and water were given only a 20% rating each; other factors, such as living space, minerals, wildlife and timber, made up the remaining 30%.

Soil was also the least polluted of our major environmental components. On a 1 to 100 scale it was given the remarkably high score of 78 (down from 80 in 1971, mainly because of erosion). Air was the most polluted of all resources, according to the Federation, scoring only 34, while water got a rating of 40.

Both the environmental importance and purity of soil may come as a surprise to ecology-minded people who are accustomed to hearing bad news more often than good. Soil has received far less attention recently than air and water (although back in the 1930's the dust bowl tragedy gave soil the headlines).

Soil tends to stay pure because it has a remarkable ability to use pollutants to strengthen itself. Nutrients such as nitrogen and phosphorus are dangerous pollutants to bodies of water, causing them to choke up with algae. But those same nutrients are fertilizers to the soil. They give the land more "grow power".

Also, soil can convert outright pollutants into harmless substances, or absorb and hold them harmless for long periods. Pesticide residues may not be broken down in air or water, and can be concentrated in the bodies of fish and sea birds. Yet they are often digested quickly in the soil.

Even carbon monoxide from automobile exhausts is detoxified by the soil, by being converted into carbon dioxide. For a long time, scientists wondered why carbon monoxide levels in the air didn't build up continuously. Their figures showed that amounts of the toxic gas should double every four to five years. But that wasn't happening.

(Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: **Audio–Visual:** **Community:**	(Continued) Then a team at Stanford Research Institute discovered that micro-organisms in the soil were absorbing the carbon monoxide. They urged that their study not be considered cause for too much optimism, however, because micro-organisms can absorb only so much carbon monoxide before becoming "stuffed". Carbon monoxide isn't the only pollutant soil is eating. U. S. Department of Agriculture scientist F. B. Abeles reported last year that soil can also remove ethylene, sulfur dioxide and nitrogen dioxide. The purification takes place quickly, within a few minutes after the gases come into contact with the soil. All those substances are serious pollutants. The living part of the soil is largely responsible for this purification process. Each teaspoon of soil is loaded with bacteria, fungi, protozoa and tiny organisms of many types. Very often they can absorb a pollutant and excrete a beneficial substance. Life in the soil is dependent upon a good supply of organic matter and humus, which is decaying organic matter. If soil humus is depleted as happens after continuous cropping, the number of soil micro-organisms declines. The pollution fighting power of soil is then lessened. Other studies have shown that soil organic matter itself has tremendous power to purify toxic substances. C. R. Harris and W. W. Sans of the Canada Department of Agriculture reported in 1969 that soil with more organic matter was able to prevent DDT and other pesticide residues from being absorbed by plants. And Russell S. Adams, Jr. of the University of Minnesota wrote recently that "with very few exceptions, pesticides are readily absorbed by soil organic matter." Despite the discovery that the organic matter in soil is the key to its purifying ability, people have shown a remarkable reluctance to give the soil the substances it needs to make humus. Garbage is usually burned or buried instead of being composted into fertilizer, for example. (Continued)

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	(Continued) The biggest and best sources of humus for the soil are animal manures and even human wastes. In a matter of a few months, with proper pretreatment, the soil could easily absorb and detoxify human wastes. Yet people are reluctant to sanction that practice, fearing disease problems. That's not logical, since raw human wastes are now being dumped into rivers, oceans and lakes with hardly a thought of the health consequences. In the soil, such wastes could be detoxified. Animal manure is a "natural" for use as fertilizer, and there probably is no other ecologically sound way to dispose of the mountains of the manure that are produced by big feedlots. Yet because manure is more cumbersome and expensive to handle than synthetic fertilizers, farmers aren't anxious to use it. If we're going to control pollution, though, we're going to have to stop thinking only about dollars and cents, and start looking at what is good for the environment as a whole. Of all our resources, soil deserves special consideration because of its surprising ability to help correct mistakes that are made in other areas of the environment.
Audio–Visual:	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 6 - Resources

SUBJECT Agriculture

ORIENTATION Soil Productivity

TOPIC/UNIT Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

State that soils vary in their productivity.

List factors that are responsible for the productivity of the soil.

Demonstrate a procedure for determining the approximate productivity of the soil.

Affective:

Appreciate the value of sustaining productive soils by suggesting to his parents or neighboring farmers that they test their soils and add fertilizer and organic matter to sustain the productivity level.

Skills Used:

1. Soil evaluation techniques.
2. Soil sampling and testing.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Improving soil productivity.
   1. Students to study a soil to determine how that soil's productivity can be improved.
   2. Students should compare adjacent fields under the same cropping and management practices.
   3. Make a study of a soil as to:
      a. Texture
      b. Structure
      c. Color
      d. pH
      e. Fertility level (NPK)

Outside or Community:

A. Have students make micromonoliths of known soil types.
B. Invite the local SCS specialist to tell about changes which have taken place in the type of farming and in the general productivity of soils and rich tilth of the community.
C. Conduct a field trip, find instances of flood and wind damage.
D. Determine the good as well as the poor practices of farming and ranching in the community which affect soil productivity.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Soil Management, Knuti, Korpi and Hide Our Natural Resources, McNall, Kirscher Interstate Soil Uses and Improvement, J. H. Stallings **Audio–Visual:** Filmstrips: (NASCO, Fort Atkinson, Wisc.) Soil Color Soil Texture Soil Structure Soil pH **Community:** SCS representative	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 7 - Land Use

SUBJECT Agriculture

ORIENTATION Land Use Competition

TOPIC/UNIT Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Describe the basis for land zoning.

Explain the procedure for zoning land including:
- a. Who zones the land
- b. Factors used
- c. Criteria for each zone classification

Affective:

Value land zoning regulations by stating that a given situation is a good use of zoning.

Defend the statement, "Taking agricultural land out of production for residential and industrial uses decreases the food production potential for future populations.

Skills Used:

1. Judging and classifying land.
2. Learn zoning regulations.
3. How to recognize soils capable of producing food and fiber

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Land classification
   1. Project study on types of land that should be used for residential, agricultural and industrial use.
   2. Students become familiar with local zoning ordinances.
   3. Student will participate in actual land classification and capabilities.

B. Project study of land sites that have recreational potential such as parks, playgrounds, hunting, forests, camps, etc.

Outside or Community:

A. Utilize SCS personnel for a field trip and class presentation.

B. Class tour of community land use.

C. Use local officials to make a class presentation in regards to zoning ordinances.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Soil Management, Knuti, Korpi and Hide Soil Uses and Improvement, J. H. Stallings **Audio–Visual:** Film: Conservation and Balance in Nature, BAVI, #6443 Filmstrip: Conservation of the City, ICE RMC, FS St 18 **Community:** SCS representative Acquire local zoning ordinances	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 8 - Values and Attitudes **SUBJECT** Agriculture

ORIENTATION Soil Appreciation **TOPIC/UNIT** Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain how values toward soil and its management differ today as compared to earlier periods.

Explain the value of crop rotation in maintaining soil productivity.

Affective:

Advocate the idea that the value of land is that of something capable of satisfying human wants.

Skills Used:

1. Construct soil micro-profile and interpretation.
2. Crop rotation planning as to soil type.
3. Identify soil productivity both actual and potential.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Find pictures to illustrate farming methods and farmsteads of the following:
   1. Egyptians
   2. Ancient Greeks
   3. Ancient Romans
   4. Europeans in middle ages
   5. American pioneers
   6. 19th Century America
   7. 20th Century America
   8. America in the 30's
   9. Farming today

B. Students are to study and determine crop rotation practices in their community and match crop rotations to certain soil types.

C. Secure local production figures for common crops. Compare these figures with national averages of those crops and with top yields of those crops.
   1. What must be done on a local farm to match the best yields?
   2. How much would it cost to do this?
   3. Is this an economically practical picture?

(Continued)

Outside or Community:

A. Contact SCS or soil specialist; have him help students prepare and interpret micro-profiles.

B. Class field trip to local museum, if available, to study farming practices in the past.

C. Conduct a field trip showing land practice management. Emphasis on good and poor management of soils.

D. Conduct a field trip to a knowledgeable retired farmer who has had a lifetime experience in agriculture and would like to relate some of these to students.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Soil Management, Knuti, Korpi and Hide	CLASSROOM (Continued) D. Students to make and study mini-profiles of various soil types.
Audio-Visual: Soil profiles	
Community: SCS or soil specialist Museum Farmer	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 9 - Management **SUBJECT** Agriculture

ORIENTATION Pesticides **TOPIC/UNIT** Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

State that pesticides are a necessary economic factor in the production of food.
Explain the need for safety in pesticide application.
Explain the role of Pure Food and Drug Administration in the use of pesticides by farmers.

Affective:

Debate the benefits and limitations of pesticides as they relate to:

a. Productivity of land and crop
b. By-product affects of pesticides
c. Safety to individuals

Want to apply pesticides according to application instructions.

Skills Used:

1. Safe use of pesticides
2. Students will identify commonly-used pesticides
3. Students will identify weeds and insects

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Pesticide investigations:
   1. Students will study concepts of chemical safety.
   2. Comparative study of crops grown with and without the use of pesticides.
   3. Study regulations of pesticide use in food production.
   4. Review the purpose of pure food and drug regulations.
   5. Determine by test the pesticide residue in soil.
   6. Students to identify common weeds and insects and determine which pesticides are needed for each.

Outside or Community:

A. Construct and use a pesticide plot. Chemicals available through University of Wisconsin.
B. Have a pesticide salesman:
   1. Give a program on pesticides and their use.
   2. Give actual demonstrations of pesticide use.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: University bulletins on pesticides.	
Audio–Visual: Fertilizer sample filmstrips Pesticides films	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 10 - Economic Planning

SUBJECT Agriculture

ORIENTATION Soil Productivity

TOPIC/UNIT Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain how soil productivity may affect long-term economic gains and losses.

Affective:

Offer an explanation of his responsibility to soils in order to keep soils productive for future generations.

Skills Used:

1. Soil evaluation techniques
2. Soil analysis
3. Land judging

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Students to report on the amounts of nutrients removed from soil by various crops.
B. Students should study the effects of continuous practices on yields and oil erosion.
C. Student should study land rehabilitation techniques.

Outside or Community:

A. Field trip
   1. Class field trip to compare soil productivity.
   2. Complete soil analysis and evaluation.
B. Conduct an in-class land judging contest.
C. Field trip to fertilizer distributor or manufacturer.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Land Use, Knuti, Korpi and Hide Natural Resources Management, Knuti, Korpi and Hide **Audio-Visual:** Film: Have Your Planet and Eat It Too, Churchill Films **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 11 - Individual Acts **SUBJECT** Agriculture

ORIENTATION Animal Waste Handling **TOPIC/UNIT** Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain how to conserve animal wastes so that they may be returned to soils with a minimum of loss.

List the most important losses occurring in most methods of animal waste handling.

Affective:

Present the value of animal wastes to soil reconstruction to others.

Evaluate home practices and make suggestions for improvement in handling animal wastes.

Skills Used:

1. Learn how to grade barnyard surfaces and properly store animal wastes.
2. Learn how to improve their own manure handling.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

Animal Waste Management

A. Students to study practices in conserving barnyard manure.
B. Consider plans of individual class members for better care of the barnyard manure on the home farm.
C. Find the fertilizer value of a ton of manure.
D. Have class members check home use of approved practices in handling manure:
   1. Conserve valuable liquid parts of manure by use of bedding, tight gutters, floors on field lots.
   2. Lessen fermentation or rotting by use of preservatives such as superphosphate.
   3. Haul manure directly to the field when practical to prevent losses of ammonia.
   4. Keep manure well packed with frequent application of straw in feed lots.

(Continued)

Outside or Community:

A. Take a field trip to several farms to observe practices in conserving barnyard manure.
B. Field trip to a farm material handling plant.
C. Presentation by a field representative to class on manure handling.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Soil Management, Knuti, Korpi and Hide **Audio-Visual:** Filmstrip: Manure Handling, NASCO Film: Pollution in Perspective - Solid Waste, General Electric AV Communications, ICE RMC, Film #300 **Community:**	CLASSROOM (Continued) D. 5. Work manure into the soil soon after application. 6. Add superphosphate to the manure to make it a balanced fertilizer. 7. Make frequent application of 4-8 tons per acre. 8. Use recommended soil and crop practices along with manure.

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 12 - Stewardship

SUBJECT Agriculture

ORIENTATION Soil Stewardship

TOPIC/UNIT Soil Science

BEHAVIORAL OBJECTIVES

Cognitive:

Present a report on practices of soil stewardship that incorporates the principles of good crop practices:

a. Rotations
b. Contour strip
c. Grassed waterways
d. Grassland farming

Affective:

Indicate an awareness of good soil stewardship values by constructively criticizing given situations.

Skills Used:

1. Crop rotation planning.
2. Effects of yields on cropping practices
3. Tree planting and forestry techniques
4. Surveying techniques

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Crop practices
   1. Student will plan crop rotation practices in his community.
   2. Students should evaluate continuous cropping practices.
   3. Student to learn principles of laying out a contour strip, grassed waterway, grassland farming.

B. Student discussion as to their responsibility in land ownership.

Outside or Community:

A. Field trip to farm with good soil management practices.

B. Have students actually develop contours, ditches, grassed waterway, farm pond in regard to theoretical surveying for these projects.

C. Have students participate in a tree planting and pruning project.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Soil Management, Knuti, Korpi and Hide	
Audio–Visual: Slide sets from NASCO on contour strips	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 1 - Energy **SUBJECT** Agriculture

ORIENTATION Sun Energy **TOPIC/UNIT** Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

Describe in writing how the sun's energy is necessary for the production of organic matter.

Describe how air pollution affects the process of photosynthesis by decreasing the amount of light penetrating the earth's atmosphere.

Affective:

Indicates awareness of affect of air pollution on photosynthesis by including statements to this effect when viewing situations in which air pollution is evident.

Skills Used:

1. Testing for starch content.
2. Testing for CO_2.
3. Testing for water.
4. How to show the effect of oxygen on combustion.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Grow beans in full sunlight and in limited light and compare the results.

B. Partially cover geranium leaves to show the effect of light on plant leaf color. Test with KI to show starch content of covered areas and uncovered areas of leaves.

C. Demonstrate photosynthesis and respiration by chemical formulas.

$$6CO_2+6H_2O \xrightarrow[\text{chlorophyll}]{\text{sun's energy}} C_6H_{12}+6O_2$$

$$C_6H_{12}O_6+6O_2 \quad 6CO_2+6H_2O+\text{Energy}$$

Blow on window to show H_2O.

Blow into CaO water to show CO_2.

D. Show burning process--use match.
--use glowing splint and oxygen.

Outside or Community:

A. Visit a greenhouse to observe light control and management.

B. Field trip to a wooded area to observe plant preference and populations as related to light intensity.

C. Visit sunny and shaded areas to show the preference of grasses for shade or sun.

D. Visit areas of heavy shade to show the absence of plant growth.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Biological Principles for Agricultural Crops, VEP-California Crop Production, Delorit and Ahlgren Experiments in Soil Science, VEP Profitable Soil Management, Knuti, Korpi and Hide Environmental Facts, Potash Institute **Audio-Visual:** Filmstrips: Ecology and Man Series, Set 3, McGraw Hill, ICE RMC, FS St 11 **Community:** Local greenhouse visits Lawns at school or on people's property Farm woodlots	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 2 - Ecosystem

SUBJECT Agriculture

ORIENTATION Crop Rotation

TOPIC/UNIT Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

List the various ecosystems that develop within each portion of the rotation.

Describe situations in which crop rotation is used to:

a. Control insects
b. Control weeds
c. Control crop diseases

Identify the effects of changing from a forest ecosystem to a farm ecosystem.

Affective:

Will suggest crop rotation as a possible solution when confronted by a person that is having problems with insects, weeds or diseases.

Skills Used:

1. Planning a crop rotation.
2. Planning the use of manure.
3. Planning fertilizer use.
4. Maintaining organic matter.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Make a map of the home farm and develop a 5-year cropping plan.
B. Discuss the ways in which crop rotations help control insects, weeds and crop diseases.
C. Show fertility balance by comparing fertility removed by crops with the fertility replaced by crop residues, manure, and commercial fertilizers.
D. Student reports:
   1. Crop rotations
   2. Value and use of manure.

Outside or Community:

A. Visit corn plots to observe insect disease and weed problems.
B. Have county SCS man present a program on rotations and land capability classes.
C. Visit corn plots to observe the effects of farm chemicals on the corn field ecosystem.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Soil Management, Knuti, Korpi and Hide, Prentice Hall Crop Production, Delorit & Ahlgren Profitable Management of Wisconsin Soil, Walsh (American Printing & Publishing Co.) **Audio-Visual:** Crop Rotation, filmstrip, NASCO Kit: The Environment of Man: An Introduction to Ecology, Educational Coordinates, ICE RMC, KT 2 **Community:** Small group visits to area farms	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 3 - Carrying Capacity

SUBJECT Agriculture

ORIENTATION Plant Population

TOPIC/UNIT Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

State five reasons why plant populations vary from field to field.
List factors in calibrating the corn planter.
Demonstrate the calibration of a corn planter for a given rate
List three ways that maximum plant population will affect the farm income.

Affective:

Argue that the time spent in calibration is time well spent during the planting season.

Skills Used:

1. Calibrating a corn planter.
2. Determining correct plant population.
3. Measuring plant population in the field.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discussion in class; the effect of the following on plant populations:
   1. Fertility
   2. Texture
   3. Moisture supply
   4. Intended use
   5. Variety
   6. Leaf angle
B. Calibrating the corn planter.
   1. Row width
   2. Kernel spacing
   3. Speed of travel
   4. New planter types
C. Calibrate a corn planter in the farm shop.
D. Student determines the plant population in a field on the home farm.

Outside or Community:

A. Field trips for plant population checks.
B. Corn yield contest for students. Complete records required.
C. If possible, observe a corn field having too high a plant population.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Calibrating Corn Planters, University of Wisc. Extension Bulletin Crop Production, Delorit and Ahlgren, Prentice-Hall **Audio-Visual:** Calibrating Planter, filmstrip, Renks **Community:** Farms and fields in local area Machinery dealers in area	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 4 - Water

SUBJECT Agriculture

ORIENTATION Water Conservation

TOPIC/UNIT Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

List six vital functions of water for plants.

Identify farming practices that will pollute other people's water supply.

Affective:

Defend the enforcement of laws and regulations pertaining to water supplies and usage even though it results in an increased cost, etc.

Skills Used:

1. Wise application of animal waste and fertilizer.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss with students ways in which the plant uses water.
B. Have students write on the blackboard the amount of water needed to produce a pound of dry matter in the production of various local crops.
C. Discuss ways how a farmer can conserve the available moisture supply.
D. Discuss the effect of overfertilizing, manure disposal and soil erosion on water quality.

Outside or Community:

A. Field trip to observe water control practices such as:
   1. Strip cropping
   2. Terraces
   3. Tiling
   4. Ditching
   5. Land leveling
   6. Mulching
   7. Formation of ponds
B. Field trip to observe several methods of animal waste storage.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Crop Production, Delorit and Ahlgren Facts From the Environment, Potash Institute	
Audio—Visual: Filmstrip: Ecology and Man Series, Set 3, McGraw-Hill, ICE RMC, FS St 11	
Community: Farms in area Sewage disposal plant	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

CONCEPT NO. 5 - Air

ORIENTATION Air Pollution

Integrated with:

SUBJECT Agriculture

TOPIC/UNIT Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

List three air pollutants and their effect on specific crops.

State the ways in which air pollution affects the students' future well being.

Affective:

Defend the enforcement of laws and regulations relating to the clean air standards even though it may cost more money, etc.

Skills Used:

1. Effects of air pollution on crops.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss how air pollution affects farm crops.
   1. Nationally
      a. Near large cities
      b. In rural areas
   2. Wisconsin
      a. Near cities
      b. Near pulp mills
      c. Near power plants
   3. Locally

B. Round table discussion on which pollutants harm crops.
   1. PAN
   2. Exhaust fumes

C. Discuss California's experiences concerning pine dieoff near Los Angeles.

Outside or Community:

A. Make a collection of articles from magazines and papers concerning the effects of air pollution on forest and agricultural crops.

B. Observe the air pollution caused by burning crop residues.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Environmental Conservation, Dosman Wiley, Chapter 13. Facts From Our Environment, Potash Institute **Audio-Visual:** Ecology and Agriculture Kit, VEP Crisis of the Environment, The New York Times, ICE RMC, KT 6 **Community:** Local sanitary landfill	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 6 - Resources

SUBJECT Agriculture

ORIENTATION Crop Geography

TOPIC/UNIT Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

Identify the major crop areas in the United States.

Explain the factors that are responsible for the major crop areas to be classified as such.

Affective:

Make a crop plan for their farms based upon soil capabilities and their own economic demands and defend their plan.

Skills Used:

1. Map making
2. Chart making
3. Soil type identification

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss the areas where different crops are grown in this country.
   1. Students prepare maps of the U.S. showing the major crop-growing areas.
      a. Corn
      b. Small grains
      c. Grass areas
      d. Cotton and tobacco
      e. Fruit and truck crops

B. Discuss why crops are grown in certain areas.
   1. Climate
   2. Soil
   3. Economic demands

C. Students prepare a field map of their farms or a sample farm, showing recommended crops to be grown based on the soil capability and the farmer's economic demand.

Outside or Community:

A. Students map their own farms by soil type and check crop production records on each type.

B. Write up data and compare, in class, the yields of crops on the various soil types in the area.

C. Have Soil Conservation Service representative talk to the class on local soil resources and accompanying cropping practices.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Farm Management Textbook, Mortensen and Hali, Interstate Crop Production, Delorit and Ahlgren, Prentice-Hall Profitable Management of Wisconsin Soils, Walsh **Audio-Visual:** Filmstrip: How Good Is Your Land?, NASCO **Community:** County agricultural agent or soil conservationist	

E. S. E. A. Title III – PROJECT I–C–L 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 7 - Land Use

SUBJECT Agriculture

ORIENTATION Land Use and Food Production

TOPIC/UNIT Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

List three ways in which economic and social changes have affected land use on our farms.

Affective:

Evaluate changes taking place now that will affect his future recreational activities and his use of leisure time and suggest changes that will be more positive in the use of available land.

Skills Used:

1. Reading or interpreting aerial maps.
2. Land use planning.
3. Recognize land capability classes.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss the food needs of the people and the amount of land available to grow food.

B. Prepare a research report on the number of crop acres in the U.S. now and 25 years ago.
   1. Land taken for suburban development.
   2. Land taken for highways and interchanges.

C. Discuss local community changes in land use for crop production.

D. Discuss how research and development has made more economical use of the remaining land possible.

Outside or Community:

A. Use aerial photographs of local area from ten year periods.
   1. Determine how much land has been taken out of production because of urban sprawl, etc.

B. Study local zoning maps and ordinances to determine which land is zoned agricultural, residential, industrial and recreational.

C. Relate violations of zoning ordinances that have occurred and their results.

D. Field trip to observe the use of Class I and Class II land for uses other than farming.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Environmental Conservation, Dasman Farm Management Handbook, Mortensen and Hall, Interstate **Audio–Visual:** Film: Bulldozed America, BAVI Filmstrips: Environmental Pollution...Our World In Crisis, ICE RMC, FS St I Ecology and Man Series, Set 3 ICE RMC, FS St II Kit: Crisis of the Environment, ICE RMC, KT 6 **Community:** District forester for aerial maps	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 8 - Values and Attitudes **SUBJECT** Agriculture

ORIENTATION Pesticides **TOPIC/UNIT** Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

List five ways in which carelessness has increased the number and scope of laws controlling the use of pesticides.

Explain the reasons for the continuous turmoil of man's attitudes toward pesticides since the publishing of Silent Spring.

Affective:

Defend the enforcement of laws and regulations concerning pesticide usage even though it results in a higher cost, etc.

Skills Used:

1. How to read and understand a pesticide table (a legal document).
2. Learn to recognize careless use and recommend the proper use of pesticides.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Study factors leading up to the outlawing of DDT.
B. Make a list of pesticides taken off the market since 1965 and the reason in each case.
C. Discuss specific instances where the use of pesticides has affected wildlife.
D. Discuss ways in which the careless use of pesticides has upset the natural balance of the insect world.
E. Discuss how the demands of the consumer have brought about increased use of pesticides.

Outside or Community:

A. Have a chemical company local representative present information about pesticides.
B. Study the labels of pesticides that are used locally. (Note fish and wildlife cautions, etc.)
C. Determine the value of a pesticide to a farmer by determining cost and resulting yield and quality increase.
D. Have a home economist give a presentation on the quality the consumer demands in produce.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Facts From Our Environment, Potash Institute Our Natural Resources, McNal Kirsher Environmental Conservation, Dasman **Audio—Visual:** Kit: The Ecological Crisis, ICE RMC, KT 14 **Community:** Chemical company local representative Sprayers and suppliers dealers	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 9 - Management

SUBJECT Agriculture

ORIENTATION Plant Pests

TOPIC/UNIT Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

List three ways in which man's manipulations of the environment have increased or decreased pest problems.

Explain the adaptation of insects to pesticides and the resultant problem.

Affective:

Exhibit a willingness to use natural checks and balances rather than pesticides whenever possible in conversation and in group discussions pertaining to crop disease and pests.

Skills Used:

1. Identification of pests.
2. Selection of pesticides.
3. Selection of resistant varieties.
4. Weed identification.
5. Checking corn yields.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss ways man's increased acreage and crop specialization has affected the pest problem:
   1. In corn (rootworm)
   2. Alfalfa (alfalfa weavel)
   3. Small grains (smut and rust)

B. How insects have adjusted to man's increased use of pesticides.
   1. Resistance to aldrin and heptachlor cf rootworms in corn.
   2. Fly's resistance to DDT.

Outside or Community:

A. Chemical company representative speak to class.

B. Field trips to observe the difference between pest populations on a field where corn is continuously planted and a field where corn is planted for the first time.
   1. Smut
   2. Rootworms
   3. Changing weed populations

C. Field trip to recently cleared woods to observe:
   1. Weed growth
   2. Regeneration of poplar
   3. Growth of unwanted species

D. Corn growing contests.

E. Checking corn yields.

F. Compare species of insects found in different environments.
   1. Pasture
   2. Corn
   3. Alfalfa
   4. Prairie
   5. Brushland

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Modern Corn Production, Aldridge Geigy Chemical Corp. bulletins Crop Production, Delorit & Ahlgren Facts From Our Environment, National Potash Institute **Audio-Visual:** Filmstrip: Modern Corn Diseases, Renks Kit: The Ecological Crisis, ICE RMC, KT 14 **Community:** Chemical corp. representative Local farm supply company	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 10 - Economic Planning **SUBJECT** Agriculture

ORIENTATION Woodlot Management **TOPIC/UNIT** Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

List three ways poor woodlot management practices can produce future losses.

Describe four proper woodlot management practices and indicate how each increases future income.

Affective:

Write a short essay on how using proper management practices now will insure that future generations will enjoy benefits of the woodlot in which information from sources outside of class are incorporated.

Skills Used:

1. Planting trees in a woodlot.
2. Planting a tree nursery plot.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss ways in which improper woodlot management can lead to losses later on.
B. Discuss the effect of pasturing the woodlot on future income.
C. Discuss the effect of woodlot burning on the woodlot in future years.
D. Show how proper woodlot management practices will insure future income.
E. Discuss the effect of overcut on the future of the woodlot.
F. Discuss the long-term cost of a clear cut when the area is replanted for a future woodlot.
G. Extra credit topics:
   1. Redwoods
   2. Forest fires
   3. Logging the pine in the late 1800's.
H. Research projects:
   1. Clear cut vs. selective cut.
   2. Man's desire for quick riches and resulting effect on forests.

Outside or Community:

A. Field trip to several woodlots.
   1. Pastured areas
   2. Overcut
   3. Poor cleanup
   4. Burning
   5. Overmaturity
B. Field trip to woodlot to observe multiple use.
C. Demonstrate underplanting on a farm woodlot.
D. Plant a tree nursery bed.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Bulletins, Wisconsin Extension Trees for Tomorrow, Eagle River Bulletins, M.S.D.A. Our Natural Resources, McNeil Environmental Conservation, Dasman **Audio-Visual:** Filmstrip: Farm Woodlot 1 and 2, University of Wisconsin Film: Conserving Our Forests Today, BAVI **Community:** Farm woodlots County forester School forest	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 11 - Individual Acts

SUBJECT Agriculture

ORIENTATION Cropping Practices

TOPIC/UNIT Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

Describe at least five ways in which poor cropping practices have caused environmental losses.

Explain how poor cropping practices of the past are affecting family life today.

Affective:

Indicate valuing of proper cropping practices by identifying poor practices and suggesting proper cropping practices for the situation.

Skills Used:

1. Making No_3 test.
2. Proper fertilizer practices.
3. Proper cropping practices.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Set up class experiment showing effects of No_3 leaking through sandy vs. silt loam soil. Make tests of water for No_3 or send to state lab for analysis.

B. Class discussion:
   1. Row crops where grasses should have been used.
   2. Poor fertilization practices.
   3. Siltation caused by poor cropping practices.
   4. Importance of contour cultivation.
   5. Discuss wise pesticide use.

Outside or Community:

A. Test stream water at various points, as above and below a source of water pollution.

B. Along with "A" above, discuss siltation.

C. Field trips to observe the subsoil showing through on hilltops as reflected by lighter color of bare soil on tops and sides of hills.

D. Measure different areas of a field for topsoil and relate how improper cropping practices caused this.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Profitable Soil Management, Knuti, Korpi and Hide Our Natural Resources, McNeil Agricultural Crops, VEP Modern Corn Production, Aldrich **Audio—Visual:** Filmstrip and cassette: Agriculture and the Environment, Voc, Ag. Service, Univ. of Illinois **Community:** Farms in area	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 12 - Stewardship **SUBJECT** Agriculture

ORIENTATION Cropping Practices **TOPIC/UNIT** Plant Science

BEHAVIORAL OBJECTIVES

Cognitive:

List the cropping practices recommended for each of the eight land capability classes.

Explain the cropping practices now in use on his farm that will preserve it for his use in later years.

Affective:

Indicate valuing of proper cropping practices by identifying poor practices and suggesting proper cropping practices for the situation.

Skills Used:

1. Planning the rotation of crops.
2. Planning the long-time cropping scheme
3. Recognizing land classes
4. Recognizing results of improper cropping practices.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Class discussion:
   1. Cropping practices from land capability standpoint.
   2. Practices followed in past and their effect at present.
   3. Farming practices that violate rights of non-owners.
      a. Solid waste disposal
      b. Crop residue burning
      c. Soil erosion due to poor cropping practices
      d. Improper use of fertilizer
      e. Improper use of pesticides

B. Planning cropping systems to meet the land capability of the home farm. Use the SCS land map.

Outside or Community:

A. SCS man
B. Fertilizer company representative
C. Conservation warden
D. Observe approved and poor cropping practices and their effects on the environment.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Productive Soil, Knuti, Korpi and Hide New Holland - Grassland Farming Crop Production, Delorit Wisconsin bulletins on land use **Audio-Visual:** Filmstrips: Land Capability, WAVAI Land Judging, WAVAI Land Classes, Nasco **Community:** SCS man Conservation warden County forester	

E. S. E. A. Title III — PROJECT I-C-E 59-70-0135-4

Environmental:

Integrated with:

CONCEPT NO. 1 - Energy

SUBJECT Agriculture

ORIENTATION Dependence of Animal on Photosynthesis

TOPIC/UNIT Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

List or identify the nutritional needs of animals.

Explain the dependence of animals upon plants and energy from the sun.

Affective:

Promote the value of formulating rations and determining amounts to feed animals through the use of reports and conversations.

Skills Used:

1. How plants grow and build food for animals.

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

A. Students will cite examples of vitamin deficiency.
B. Students to study effects of Vitamin D on animals.
C. Students to formulate a ration and determine amount and kinds of feeds required.
D. Student to trace the digestion of a food to its final nutrient parts of carbohydrates, fats, proteins, vitamins and minerals.

Outside or Community:

A. Demonstration project at home town feed mill.
B. Essentials of a ration for poultry (origin of components). Develop balanced ration.
C. Construct a photosynthesis experiment.
D. Conduct a feed study with small animals. Show deficiencies of certain vitamins and minerals.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Feeds and Feeding, Morrison Livestock and Poultry Production, Bundy and Diggins Dairy Production, Diggins and Bundy Modern Dairy Cattle Management, Davis	
Audio–Visual: Transparencies & filmstrips: Plant Growth Photosynthesis Vitamin Synthesis	
Community: Greenhouse facility	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 2 - Ecosystem

SUBJECT Agriculture

ORIENTATION Rumen Bacteria

TOPIC/UNIT Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

Compare the digestive processes of different livestock species.
a. Cattle
b. Hog
c. Chicken
d. Sheep

Affective:

Demonstrate awareness of differences in digestive systems of animals and advantages of four-compartment stomach by explaining the differences and value to others.

Skills Used:

1. Identify major parts of digestive tract.
2. Rumen inoculation techniques

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Develop rations for different classes of livestock and compare nutrient requirements.
B. Students to determine effects of diet on production of dairy cattle by controlling dry roughage to concentrates.
C. Student to study ruminant digestion.

Outside or Community:

A. Get digestive tract of cow and hog from slaughterhouse.
B. If possible, observe a fistulated animal and rumen contents.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Feeds and Feeding, Morrison Dairy Production, Diggins and Bundy Modern Dairy Cattle Management, Davis **Audio-Visual:** Film: Story of Digestion, Ralston Purina Company **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 3 - Carrying Capacity

SUBJECT Agriculture

ORIENTATION Stress of Population on Environment

TOPIC/UNIT Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

Determine the carrying capacity of a given acreage by:

a. Pasturing
b. Green chopping
c. Dry feeding in lot

Describe factors that can be used to improve permanent pasture carrying capacity.

Affective:

Demonstrate awareness of the result of overgrazing of pasture or having too many animals for farm to raise feed for by identifying this type of situation while on a field trip.

Skills Used:

1. Develop improved pasture practices.
2. Develop methods of increasing production per acre.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Make up a chart of improved pasture seedling rates.
B. Develop a plan for improving a permanent pasture.
C. Consider a plan for a total feed storage.
D. Students to develop a pasture renovation plan.
E. Students to determine the proper numbers of animals to pasture acreage and also the number of livestock units per crop acre.
F. Students to compare livestock units to feed capacity, carrying capacity and all feeding management problems.

Outside or Community:

A. Field trip to farms with good pasture management techniques.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Dairy Production, Diggins and Bundy **Audio–Visual:** Film: Grass - The Big Story, BAVI **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 4 - Water

SUBJECT Agriculture

ORIENTATION Water Supply - Animal Waste Disposal

TOPIC/UNIT Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain the values of organic matter particularly its effect on the water-holding capacity in the soil.

Compare the value of organic matter in increasing or decreasing the water percolation rate in each major type of soil.

Affective:

Question a plan for increasing water-holding capacity of a soil if it does not include the addition of organic matter.

Skills Used:

1. Student to learn how to incorporate animal wastes into the soils in the most effective way and time, preserving a pure water supply.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Procure samples of sand and clay and organize an experiment using a control and various minerals and organic soils with combination of organic matter and water percolation through various types of soils.

Outside or Community:

A. Survey animal waste disposal systems of class and neighbors.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Livestock and Poultry Production, Bundy and Diggins Dairy Production, Diggins and Bundy Modern Dairy Cattle Management, Davis crop tests soil tests **Audio-Visual:** Film: The Gifts, ICE RMC, Film #280 **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

CONCEPT NO. 5 - Air

ORIENTATION Ventilation of Livestock Structures

Integrated with:

SUBJECT Agriculture

TOPIC/UNIT Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain the values of odor-free air and its effects on livestock health.

Affective:

Demonstrate an awareness of the importance of odor-free air to livestock by identifying situations of air that may be harmful to the livestock's health and suggesting changes to correct the situation.

Skills Used:

1. Amount of fresh air needed for different classes of livestock and how to provide it.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Ask group of students to prepare classroom (turn off ventilation system, saturate air with steam, saturate air with odor). Just previous to class time, allow all students to enter and immediately start ventilating system.
   1. Check temperature, humidity and odor every five minutes.
   2. While discussing needs of air with optimum of oxygen content and detrimental effects of low oxygen in air, talk about the needs of any animal.

Outside or Community:

A. Survey of barn ventilating systems of students.
B. Visit recently constructed livestock buildings with environment controls.
C. Students to participate in "Farm Institutes or Dairy Day".
D. Field trip to farm material handling show.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Dairy Production, Diggins and Bundy Modern Dairy Cattle Management, Davis Dairy Cattle Housing Handbook, Midwest Plan Service Booklet Wisconsin Bulletins - University of Wisconsin **Audio-Visual:** Film: Air Pollution, BAVI **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 6 - Resources **SUBJECT** Agriculture

ORIENTATION Cow to Roughage vs. Roughage to Cow **TOPIC/UNIT** Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

Compare green chopping and pasture feeding practices in:
a. Production potential
b. Land resource conservation value

Affective:

Demonstrate the value of not allowing animals to waste raw materials by suggesting changes to farmers that result in less waste of these materials on their farms.

Skills Used:

1. Economics of various feeding methods and its effect on total acreage output.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Student comparisons of:
   1. Waste acres due to fencing farm lanes.
   2. Benefits of improved rotation and pasture renovation.
   3. Comparison of green chopping vs. pasture feeding.

Outside or Community:

A. Survey "summer" feeding practices of student farms and a neighbors.
B. Determine acres wasted by fencing farm lanes on an actual farm field trip.
C. Observe techniques involved in green chopping and feeding.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Feeds and Feeding, Morrison University of Wisconsin bulletin "Summer Feeding" Modern Dairy Cattle Management, Davis Dairy Production, Diggins and Bundy	
Audio–Visual:	
Community:	

E. S. E. A. Title III — PROJECT I-C-E 59-70-0135-4

Environmental: | **Integrated with:**

CONCEPT NO. 7 - Land Use | **SUBJECT** Agriculture

ORIENTATION Meat Consumption | **TOPIC/UNIT** Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

Explain the customer preference for lean meat and its effect on the price paid for fat meat animals and lean meat animals.
Demonstrate basic judging skills by judging live animals or pictures of animals in accordance with species and breed criteria.
a. Beef cattle
b. Hogs

Affective:

Demonstrate the value of responding to consumers' demands by selecting animals for meat production in accordance with the lean meat characteristics.

Skills Used:

1. Livestock evaluation techniques
2. Livestock judging

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

A. Students, with practice sets of AV materials, will develop basic judging skills.
B. Using statistics of changing attitudes of meat demands, students will show by graphs and charts changing consumer demands.

Outside or Community:

A. Field trips:
1. Livestock evaluation practice on a farm.
2. Observe or show an animal in the marketing class in local farms.
3. View carcasses at meat cutting shops or packing plants.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Livestock and Poultry Production, Bundy and Diggins	
Audio–Visual:	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 69–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 8 - Values and Attitudes **SUBJECT** Agriculture

ORIENTATION Vegetable vs. Animal Foods **TOPIC/UNIT** Animal Science

BEHAVIORAL OBJECTIVES	STUDENT–CENTERED LEARNING ACTIVITIES	
	In-Class:	Outside or Community:
Cognitive: Compare the nutrient value of meats and vegetable substitutes for meats.	A. Judge classes of: 1. Beef 2. Dairy steers 3. Swine 4. Lamb B. Grade market classes of: 1. Beef 2. Swine 3. Lamb 4. Dairy steers C. Have students make comparisons of animal and vegetable (substitutes) nutrient values.	A. Visit Equity Co-op Auction Market or Wisconsin Feeder Pig Co-op and see quality (grading) and its effect on pricing. B. Grocery store field trip observing meat cuts and grades; also students should observe substitute availability.
Affective: Accept the need to evaluate animals by selecting only lean meat producers for feeding.		
Skills Used: 1. Visual "judging" of live animals according to "standards".		

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Feeds and Feeding, Morrison Modern Dairy Cattle Management, Davis Dairy Production, Bundy and Diggins Livestock Judging Handbook **Audio-Visual:** **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 9 - Management **SUBJECT** Agriculture

ORIENTATION Artificial Insemination vs. Natural Breeding **TOPIC/UNIT** Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

Compare artificial insemination with natural breeding methods in:
a. cost
b. improvement of production
c. inbreeding

Affective:

Defend the use of artificial insemination and natural breeding methods as both being acceptable in appropriate situations.

Skills Used:

1. Improving strains of livestock.
2. Reading of pedigrees.
3. Understanding sire evaluation reports

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Compare Texas Longhorn with Herford.
B. Compare Texas Longhorn with modern Holstein.
C. Students to compare USDA report on sires.
D. Students should become proficient at reading and understanding pedigrees.

Outside or Community:

A. Visit Midwest Breeders or ABS or Tri-State Organization.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications:	
Audio–Visual:	
Community:	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: Integrated with:

CONCEPT NO. 10 - Economic Planning SUBJECT Agriculture

ORIENTATION Woodlot Grazing TOPIC/UNIT Animal Science

BEHAVIORAL OBJECTIVES	STUDENT–CENTERED LEARNING ACTIVITIES	
	In-Class:	Outside or Community:
Cognitive: Describe the loss in economic value due to woodlot over-grazing.	A. Students will evaluate rounds of TDN on various types of land with various crops. B. Students to compute the animal unit potential of a given pasture problem under various conditions at different times of year.	A. Field trip to a forest used as a pasture. B. Visit to pasture renovation site.
Affective: Demonstrate awareness of permanent destruction due to overgrazing by identifying such areas while on a field trip.		
Skills Used: 1. Pasture management techniques. 2. Determine pasture quality. 3. Determine carrying capacity.		

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Crop Production, Delorit, Ahlgren Modern Dairy Cattle Management, Bundy and Diggins Feed and Feeding, Morrison **Audio-Visual:** **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 11 - Individual Acts

SUBJECT Agriculture

ORIENTATION Animal Mistreatment

TOPIC/UNIT Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

Describe economic significance of mistreatment of animals.

Describe and demonstrate the proper procedures for:
a. Castration of a pig
b. Dehorning of calf and cow
c. Hoof trimming of a calf and cow

Affective:

Demonstrate responsibility to humane animal treatment by identifying situations of animal mistreatment and suggesting actions to remedy this mistreatment.

Skills Used:

1. Correct animal loading and transportation techniques.
2. Castration, dehorning, hoof trimming and general handling.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Student to discuss proper handling techniques of livestock.
B. Have cattle buyer or trucker discuss economics of livestock mistreatment.
C. Student demonstration of techniques of castration, dehorning, hoof trimming, and general livestock management.

Outside or Community:

A. Field trip to packing plant to view cases of animal mistreatment.
B. Field trip emphasizing practices of dehorning, castrating, hoof trimming, and general livestock management.
C. Have veterinarian discuss instances of animal mistreatment.
D. Field trip to local humane society.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Feeds and Feeding, Morrison Livestock Management Stockman's Handbook, Ensminger **Audio–Visual:** Filmstrip: Livestock Handling, techniques of castrating, dehorning **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

CONCEPT NO. 12 - Stewardship

ORIENTATION Animal Wastes

Integrated with:

SUBJECT Agriculture

TOPIC/UNIT Animal Science

BEHAVIORAL OBJECTIVES

Cognitive:

List three ways why the handling of animal wastes is a responsibility of the farmer.

List three ways in which improper handling of animal wastes affects people other than farmers.

Affective:

Indicate awareness of existence of improper handling of animal wastes by identifying situations of improper handling and reporting them to the class.

Skills Used:

1. Planning a manure storage system.
2. Planning the manure use on the home farm.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss in class the following:
   1. Winter spreading
   2. Nitrate pollution of water supplies
   3. Stream pollution
   4. Offensive odors
   5. Unsightly storage
   6. Loss of nutrients by improper handling
   7. Costs to farmers of these losses
   8. Environmental effects of improper manure management

B. Have students collect, mount and summarize magazine and newspaper articles on animal wastes.

C. Compare the methods used for manure storage.

Outside or Community:

A. Field trips to observe manure handling and storage.
B. ASCS man
C. SCS representative
D. DNR representative
E. Resource development agent
F. Machinery and farm equipment dealers
G. Field trip to materials handling exposition

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Wisconsin Bulletin on Manure Handling, UW-Extension Productive Soils, Knuti, Korpi and Hide New Idea Bulletin - Manure **Audio-Visual:** Filmstrip: Manure Handling, NASCO SCS colored slides, SCS man ASCS slides, County ASCS man **Community:** Color slides of manure handling systems in local area	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

CONCEPT NO. 1 - Energy

ORIENTATION Fuel Use Economics

Integrated with:

SUBJECT Agriculture

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

Describe three ways in which the farmer can use fossil fuels more efficiently.

Explain why man should use fossil fuels as efficiently as possible.

Affective:

Defend such items as tractor tune-ups, etc., even though costly, in terms of fuel efficiency.

Skills Used:

1. Use of dynamometer.
2. Tractor adjustment.
3. Recognize ways in which fuels are wasted.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. List ways in which home heating costs can be reduced.
B. Compare the efficiency of small tractors and large tractors.
C. Demonstrate the use of the dynamometer in adjusting the tractor for maximum efficiency.
D. Discuss ways in which air pollution is increased by wasting fuel and energy.
E. Discuss use of electricity at low use and peak use periods.

Outside or Community:

A. Machinery and tractor dealers.
B. Local building contractor.
C. Field trip to observe building design.
D. Power company farm agent.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Electricity on the Farm, Power Company Farm Mechanics Handbook, Cook Insulation Bulletin, UW-Extension Environmental Conservation, Dasman Our Natural Resources, McNall **Audio-Visual:** Film: A World Is Born, ICE RMC Film #220 **Community:** Power company Gas company Local lumber dealer Local machinery dealers	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 2 - Ecosystem

SUBJECT Agriculture

ORIENTATION To Specialize or Diversify

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

Explain how plants, insects and disease pests are affected by specializing or diversifying crops and varieties in writing.

Affective:

Will report in writing how variety and crop diversification affects farmers economically.

Skills Used:

1. Planning the rotation.
2. Planning use of money.
3. Most efficient uses of land, labor, capital.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss how specialization may have contributed to:
   1. Corn leaf blight
   2. The spread of corn borer
   3. The incidence of hog cholera
B. How did specialization and a combination of natural factors cause low corn prices in 1972?
C. Discuss ways in which diversification can act as insurance to farmers.
D. How does the "law of diminishing returns" relate to specialization.
E. Compare animal disease problems in our diversified area to concentrated livestock areas such as in Iowa.
F. Discuss ways in which a farmer can diversify within:
   1. the dairy enterprise.
   2. the swine enterprise.
   3. the cropping system.

Outside or Community:

A. Have students select articles from magazines which relate to specialization and report them to the class.
B. Have students prepare class reports on how specialization and diversification affect farm planning and management.
C. Prepare a scrapbook of clippings on the subject of diversification and specialization.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Conservation of Natural Resources, Guy-Harold Smith Conserving American Resources, Parson, Prentice-Hall Our Natural Resources, McNall and Kirscher Interstate Environmental Conservation, Dasman The Farm Management Handbook, Hall and Mortenson Profitable Soil Management, Knuti, Korpi and Hide **Audio-Visual:** Films: Nature's Half Acre, ICE RMC, Film #210 One Day at Teton Marsh, ICE RMC, Film #200 **Community:**	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental: **Integrated with:**

CONCEPT NO. 3 - Carrying Capacity **SUBJECT** Agriculture

ORIENTATION Cropping Plans **TOPIC/UNIT** Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

List at least three ways in which farm management practices are dependent on carrying capacity of land.

Affective:

Defend the practice of not exceeding the normal carrying capacity of the land in terms of environmental costs.

Skills Used:

1. Planning the rotation in relation to soil resources.
2. Planning rotations and cropping plans that conserve the soil.
3. Planning the farm business with optimistic plant and animal populations as a goal.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Have students plan the size of livestock enterprises that their home farms can raise feed for.
B. Using a soil-conserving rotation, have students plan a maximum carrying capacity for their home farms.
C. Show how high-producing crops will enable a farm to support more livestock. Compare corn and oats, alfalfa and grass.
D. Discuss the effect of too many animals on a given area such as cattle in a feeding area.

Outside or Community:

A. Have students select and report to the class on magazine articles that relate to carrying capacity.
B. Explain how overgrazing affects the environment.
C. Explain the effect of high plant populations on corn yield.
D. Have students relate the problems which arise when large numbers of animals are quartered in small areas.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

People, USDA Yearbook, 1971, Pages 1-144, 240-44, 362-85
Environmental Conservation, Dasman
Our Natural Resources, McNall and Kirscher
The Farm Management Handbook, Hall and Mortenson
Crop Production, Delorit and Ahlgren

Audio-Visual:

Film:
Nature's Half Acre, ICE RMC, Film #210
Filmstrip:
Ecological Imbalance: Six Systems Dispoiled, ICE RMC, FS St 2

Community:

E. S. E. A. Title III - PROJECT I-C-E 59-70-0135-4

Environmental: **Integrated with:**

CONCEPT NO. 4 - Water **SUBJECT** Agriculture

ORIENTATION Farm Water Supply **TOPIC/UNIT** Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

Prepare a list of five major areas in which a farmer's concerned with pure water.

Describe three ways in which water purity practices affect people who live in neighboring or even far off places.

Affective:

Defend the practice of proper waste disposal in terms of water purity and health of people and animals.

Skills Used:

1. Planning animal waste storage and use.
2. Planning building and yard drainage.
3. Planning a septic system for a farm house.
4. Run percolation tests.

STUDENT-CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss the importance of the well to farm income and living.
B. Relate why animal waste disposal must be planned for.
C. How does a pure water supply affect milk marketing?
D. Discuss ways in which farmstead layout and drainage is important to water supply.
E. Discuss the importance of adequate farm sewage disposal.
F. Have students figure the dollar investment they will need to insure pure water both for themselves and for those on the downhill side.
G. Discuss the eutrophication process going on in a nearby lake or pond and the effect of farming practices on the rate of eutrophication.

Outside or Community:

A. Have students report to the class on magazine articles referring to animal waste disposal.
B. Have student prepare a farmstead layout plan for their home which shows drainage, well location, animal waste storage and the sewage system.
C. Students will plan an animal waste storage system for their home farm.
D. Visit farms in area and observe animal waste storage systems.
E. Have students prepare a paper outlining the state well code for farms selling Grade A milk.
F. Run percolation tests.

SUGGESTED RESOURCES

Publications:

Conservation of Natural Resources, Guy-Harold Smith
Conserving American Resources, Parsons
Facts From Our Environment, Potash Institute
National Wildlife, April/May, 1972, Feb./March, 1972
People, USDA Handbook, 1971, Pages 304-8, 345-50, 350-60, and 282-83.
Our Natural Resources, McNall and Kirscher (Continued)

Audio-Visual:

Film:
The Gifts, ICE RMC, Film #280
Kit:
Crisis of the Environment, ICE RMC, KT 6

Community:

CONTINUED OR ADDED LEARNING ACTIVITIES

PUBLICATIONS (Continued)
Environmental Conservation, Dasman
Profitable Soil Management, Knuti, Korpi and Hide

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 5 - Air

SUBJECT Agriculture

ORIENTATION Farmstead Planning

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

List three ways in which farmers can reduce air pollution in normal farm operation.

Explain ways in which the control of air pollution on the farm will affect the attitudes of non-farmers toward farmers.

Affective:

Prepare a 200-word essay portraying the concept, "All men have a right to pure air and the farmer has an obligation to keep air clean."

Skills Used:

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss the pollution problem for different fuels used on the farm.
B. Have students plan farmstead layout, with the prevention of air pollution as a major factor.
C. Discuss the prevailing winds as a factor in farmstead planning.
D. Discuss how handling of animal wastes affects air pollution.

Outside or Community:

A. Have students observe the odors caused by handling stored disposed animal wastes.
B. Have students list ways in which farm and farm-related operations pollute the atmosphere.
C. How is technical knowledge used by farmers a force in both adding pollution and reducing pollution?
D. Have students recall ways in which milk manufacturing operations cause air pollution in our area.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

National Wildlife, April/May, 1972, Feb./March, 1972
Science for Better Living, USDA Yearbook, 1968, pages 142-46
A Place to Live, USDA Yearbook, 1963, pages 81-132.
Environmental Conservation, Dasman
Our Natural Resources, McNall and Kirscher
The Farm Management Handbook, Hall and Mortenson

Audio-Visual:

Kit:
Environmental Quality Index - America Is In Trouble, ICE RMC, KT 9
Filmstrip:
Environmental Pollution...Our World in Crisis, ICE RMC, FS St 1

Community:

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 6 - Resources

SUBJECT Agriculture

ORIENTATION Marketing

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

Describe five examples of how distribution of resources has affected the marketing structure.

List and explain at least two ways in which resource distribution has had a major effect on his life.

Affective:

Promotes the idea that resource distribution affects everyone by compiling examples and including them in a report given to others.

Skills Used:

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss how the soil resources of the nation have affected the marketing of farm products.
B. Have class relate how natural resources distribution has caused the meat packing industry to locate in certain areas.
C. How has water transportation affected the marketing of farm produce?
D. Discuss how natural resources have combined to make Wisconsin a dairy state.
E. Discuss how the distribution of soil resources in Wisconsin has caused different economies to develop throughout the state.

Outside or Community:

A. Students should observe and list illustrations of the unequal distribution of natural resources in the local area and how it has affected farming.
B. Students should use observations made on a trip that illustrate how available resources have affected the farm economy.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Conservation of Natural Resources, Guy-Harold Smith Our Natural Resources, McNall and Kirscher Environmental Conservation, Dasman Power to Produce, USDA Yearbook, 1960, pages 261-78 The Farm Management Handbook, Hall and Mortenson Profitable Soil Management, Knuti, Korpi and Hide **Audio-Visual:** Filmstrips: Ecology and Man Series, Set 2, ICE RMC, FS St 10 Ecology and Man Series, Set 3, ICE RMC, FS St 11 **Community:** Land capability and soil judging	

E. S. E. A. Title III – PROJECT I-C-E 59-70-0135-4

Environmental:

Integrated with:

CONCEPT NO. 7 - Land Use

SUBJECT Agriculture

ORIENTATION Zoning Ordinances

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

State four reasons that indicate why land zoning has become a necessity in the local area.

Affective:

Point out how the local zoning ordinances will benefit residents of the area in years to come by presenting specific examples.

Skills Used:

1. Reading a zoning map

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss in class how the following have made local zoning ordinances necessary:
   1. Facilitating transportation
   2. Economic conditions
   3. More leisure time
   4. Urban population growth
   5. Crowded city conditions
B. Go through local zoning ordinances and list ways it affects:
   1. Farmers
   2. Lakeshore owners
   3. Rural residents
C. Check local zoning ordinances in regard to:
   1. Junkyards
   2. Industry

Outside or Community:

A. County Resource Development Agent.
B. County Zoning Administration.
C. Field trip to observe:
   1. Filling
   2. Land leveling
   3. Sewage disposal
   4. Dumping practices
   5. Subdivisions
      a. Housing
      b. Recreational homes
D. City Planning Commission

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Local zoning ordinances and maps	
Audio-Visual: Kits: Environmental Quality Index - America Is In Trouble, ICE RMC, KT 9 The Ecological Crisis, ICE RMC, KT 14 America's Urban Crisis, ICE RMC, KT 13 Saving What's Left, ICE RMC, KT 28	
Community: County Resource Development agent County Zoning Administration City Planning Commission	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 8 - Values and Attitudes

SUBJECT Agriculture

ORIENTATION Government Aid to Farmers

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

List three areas in which the government has taken a major role in influencing man's attitude toward environment.

Evaluate the effect of federal farm programs on farm family life.

Affective:

Argue for the continuance of federal farm programs by including specific examples indicating the value of such programs.

Skills Used:

1. Planning a manure storage and handling system.
2. Use of a level.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss the soil conservation program that the government carried on from the 1930's till present.
B. Discuss the causes, effects and treatment of the dust bowl of the West.
C. What have government programs done to develop the farm woodlot practices that are followed?
D. How has the government reclamation program helped farmers?
E. How has the Federal Program affected the development of farm products?
F. Discuss probable future developments in handling animal wastes.

Outside or Community:

A. Visit a farm that has a soil-conserving plan in operation.
B. Have the SCS man talk to the class about local problems.
C. Observe a well-planned and constructed farm pond and write a paragraph explaining its affect on the ecology of the area.
D. Visit several farms with the SCS man to observe methods of storing manure.
E. ASCS representative.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Conservation of Natural Resources, Guy-Harold Smith Our Natural Resources, McNall and Kirscher Environmental Conservation, Dasman Profitable Farm Marketing, Snowder Farm Management Handbook, Hall and Mortenson **Audio-Visual:** Filmstrip: Land Capability, WAVAI SCS man - slides of animal waste problems and treatment, farm ponds **Community:** SCS representative ASCS representative	

E. S. E. A. Title III – PROJECT I-C-E 59-70-0135-4

Environmental:

Integrated with:

CONCEPT NO. 9 - Management

SUBJECT Agriculture

ORIENTATION Rural Sociology and Urban/Rural Relationships

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

List three ways in which modern rural living standards have changed our environment.

Evaluate the change in living standards as being good or bad and justify your choice.

Affective:

Advocate that changes in rural/urban relations have been beneficial in creating an awareness of rural pollution problems.

Skills Used:

1. Recognize environmental changes caused by agriculture.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss how changes in our rural standard of living has caused sewage problems.
B. How have changes in the family farm contributed to the problems of animal waste disposal?
C. Discuss how changes in rural/urban relations have caused city people to become aware of rural pollution problems.
D. Discuss how man's effort to improve his living standards has in some cases increased water pollution.
E. How has the farmers' efforts to earn a living for his family added to air pollution?
F. Discuss this statement, "Most things a farmer does affect the environment".

Outside or Community:

A. List the ways in which area farmers add to the pollution of:
   1. Water
   2. Air
   3. Noise
B. Prepare a list of ways in which the beauty of your area has been affected by changes in rural living.
C. What new businesses have sprung up in your school district because of changes in rural life?

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES

Publications:

After a Hundred Years, USDA Yearbook, 1972, pages 525-51
Conserving American Resources, Parsons
Conservation of Natural Resources, Guy-Harold Smith
Environmental Conservation, Dasman
Our Natural Resources, McNall and Kirscher

Audio-Visual:

Film:
Bulldozed America, BAVI
Filmstrips:
Environmental Pollution...Our World in Crisis, ICE RMC, FS St 1
Urban Ecology: Six Microsystems, ICE RMC, FS St 3

Community:

County Resource Development agent

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 10 - Economic Planning

SUBJECT Agriculture

ORIENTATION Land Use

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

List three examples of how short-term land use gain has resulted in losses later on.

List three ways in which practices used by past generations are affecting his life today.

Affective:

Advocate that present land use practices will affect the amount and quality of land available for the future and will support this with examples from the past that have resulted in both better and poorer land.

Skills Used:

1. Planning crop rotations.
2. Woodlot management.
3. Planting wildlife food habitats.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss how the share cropping system of the South resulted in long-lasting soil damage.
B. Discuss how short-term gains resulted in the dust bowl of the West.
C. Discuss the damages to forest land resulting from unwise logging practices.
D. Discuss how careless use of soil has affected the generations that followed.
E. Discuss ways in which man's desire to produce has affected wildlife areas.
F. Show how man's desire to make money has caused air and water pollution.

Outside or Community:

A. Students can prepare a collection of news articles from papers and magazines that illustrate this concept.
B. Students can do an extra credit project consisting of research and writings of how careless logging practices resulted in great waste and how this now affects our forest resource.
C. Students prepare a report to the class on the dust storms of the West, their causes and cures.
D. Write an essay on Concept #10.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: Conservation of Natural Resources, Guy-Harold Smith Conserving American Resources, Parsons USDA Yearbook, 1963, pages 57-80 **Audio-Visual:** Film: The Dust Bowl, BAVI Kit: Crisis of the Environment, ICE RMC, KT 6 Filmstrip: Ecology and Man Series, Set 3, ICE RMC, FS St 11 **Community:** Visit a clearcut farm woodlot Make soil profile study along a stream bank or flood plain	

E. S. E. A. Title III – PROJECT I-C-E 59-70-0135-4

Environmental: **Integrated with:**

CONCEPT NO. 11 - Individual Acts **SUBJECT** Agriculture

ORIENTATION Marketing **TOPIC/UNIT** Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

List in writing three ways in which consumer demands have induced farmers to cause ecological change.

Explain, including an example, how consumer demands have caused changes in the management of his home farm.

Affective:

Evaluate the rights and responsibilities of consumers in their demands which cause changes in farm management practices.

Skills Used:

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss the effect that a big demand for wheat had on the prairie area of the West.
B. Discuss how consumer demand for convenience packaging of farm produce has caused environmental problems.
C. Have students prepare a write-up on ways in which the demands of the American housewife have caused farmers to use production practices that have had bad effects on the environment.
D. Discuss ways in which individual acts of farmers have caused changes that have made necessary expensive treatments later on.
E. Discuss ways in which a recycling program will help.

Outside or Community:

A. Collect magazine and newspaper articles that illustrate the concept that consumer demand changes farm production.
B. Collect magazine and newspaper ads, pictures, package labels, etc. that illustrate how consumer demands have caused solid waste problems.
C. Collect packaging material that is used because of consumer demand and rate it as to its degradability.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: USDA Yearbook of Agriculture, 1962, pages 152-7, 187-201, and 513-24 Conserving American Resources, Parsons Conservation of Natural Resources, Guy-Harold Smith	
Audio-Visual: Films: Garbage, ICE RMC, Film #260 Junkdump, ICE RMC, Film #310 Filmstrip: Ecology and Man Series, Set 3, ICE RMC, FS St 11	
Community: Sanitary landfill Supermarket Roadsides	

E. S. E. A. Title III – PROJECT I–C–E 59–70–0135–4

Environmental:

Integrated with:

CONCEPT NO. 12 - Stewardship

SUBJECT Agriculture

ORIENTATION Land Ownership

TOPIC/UNIT Farm Economics

BEHAVIORAL OBJECTIVES

Cognitive:

List three ways in which a farmer should practice good stewardship.

List three examples of how a farm owner should respect the rights and privileges of others.

Affective:

Argue against the farmer's right to use waste material practices and pesticide applications in the manner he wishes because it is his own property.

Skills Used:

1. Planning a manure storage facility.

STUDENT–CENTERED LEARNING ACTIVITIES

In-Class:

A. Discuss how the damming of a stream affects the rights of neighbors.
B. Discuss how the installation of field drains can affect the neighbor's rights.
C. Discuss the responsibilities of the landowner in regard to stewardship of the soil.
D. Compare the future impact of harvesting of the woodlot by:
   1. Cutting all timber to six-inch diameters.
   2. Selective cutting on a continued yield basis.
   3. Clear cutting.
E. Discuss ways in which farm sewage disposal might affect the neighbors.
F. Discuss the problems of manure storage and disposal in regard to the neighbors and others.
G. Discuss the ways in which the use of pesticides can affect the rights and privileges of others.
H. Discuss how the disposal of animal wastes is a responsibility of the farmer.

Outside or Community:

A. Visit two farms and inspect the manure handling facilities.
   1. Loose housing.
   2. Conventional housing.
B. Visit a community water runoff control project and see the ways in which cooperators participate. If there are non-cooperators, try to visit these.
C. Visit a farm woodlot that has been harvested selectively.
D. Observe a woodlot that has been clear cut recently.
E. On a field trip, observe how careless soil usage will affect those who will own the land later.
F. Observe how lack of soil-conserving practices has caused damage to land further down the waterway.

SUGGESTED RESOURCES	CONTINUED OR ADDED LEARNING ACTIVITIES
Publications: USDA Yearbook, 1963, pages 57-80 and 513-24 Conserving American Resources, Parsons Conservation of Natural Resources, Guy-Harold Smith Our Natural Resources, McNall and Kirscher **Audio-Visual:** Films: Man Uses and Changes the Land, BAVI Problems of Soil Conservation, BAVI Survival of the Prairie, BAVI **Community:**	