

# Ecosystems— The Essential Connection



**LEVEL:** 8th Grade

**Core Content Areas:** Math, Practical Living/  
Vocational Studies, Reading, Writing

**LEARNING GOAL:** Students shall develop their abilities to connect and integrate experiences and new knowledge from all subject matter fields with what they have previously learned and build on past learning experiences to acquire new information through various media sources.

## MATERIALS

Spider map graphic organizer, KY Agricultural Wealth worksheet

## VOCABULARY

Ecosystem, natural resources (sunlight, air, water, soil, minerals), interdependent, habitat, interrelated, erosion, conservation, tillage.

## SUPPORTING INFORMATION

John Muir, noted conservationist of the 1800's said "When we try to pick anything by itself we find it hitched to everything else in the universe." In this statement, he was emphasizing that all living things are both interrelated and interdependent. These connections of living organisms within a particular environment are called ecosystems. Ecosystems are supported by the natural resources of sunlight, air, water, soil, and minerals. They tend to remain in balance unless altered by human or natural events such as hurricanes, drought, or flood. People do impact many ecosystems in order to obtain a desired product or satisfy basic needs for food, shelter, and clothing. The habitats of any ecosystem can be protected by responsible human decision about how we live, produce food and use energy.

## PROCEDURE

1. To define ecosystems, have students consider their membership in a group such as their school. Draw a spider map on the board. Write the school's name in the center, example: Anytown Middle School. Ask students to describe the different people who make it possible for them to function as a group each day: parents, school bus driver, teacher, principal, office secretary, and lunchroom personnel. Record their responses on the spokes of the map. Ask what would be the consequences of effects of any of the group member's failure to fulfill a specific responsibility. When students have completed the spider map, explain that nature is made up of countless ecosystems which function in very much the same as their school—the living organisms are interde-

pendent and interrelated. Their class could be considered a habitat within the school "ecosystem".

2. Divide the class into three problem solving groups to develop ways to protect the natural resources of air, water, and soil. Each group should approach the problem from the perspective of an individual and group responsibility. The "air" group should consider auto emission control, manufacturing, burning, and garbage disposal. The "water" group should discuss water conservation in both home use and agricultural production. This group should also consider sources of water pollution. The "soil" group should discuss erosion control in both urban and rural areas. In urban areas, rain can wash soil from around new houses in the street, storm drains, or sewers. Trees, grasses, and other plants must be established to prevent urban erosion. On farms, erosion can be controlled through conservation tillage. Two examples: reduced and no-tillage (cultivation where plant residues from last year's crop are left on top of the soil to hold it down instead of plowing it under). Have each group present their strategies to protect these three essential natural resources to the class.
3. It was once said that, "farmers are true environmentalists". Is this still true today? Look at modern production farming and livestock operations and how they operate today. What stewardship/conservation practices are used throughout various operations? And why? How do they differ by types of operation? How are these operations interdependent on various ag sectors and also interrelated to your daily life? How do they work to protect our natural resources? Have the students write a paper discussing the many ways producers farm and protect our environment.

### MEETS KY CORE CONTENT 4.1 ASSESSMENT STANDARDS

#### Science

SC-08-4.6.5  
SC-08-4.7.1  
SC-08-4.7.2

#### Math

MA-08-4.1.1  
MA-08-4.1.2

#### Practical Living/Vocational Studies

PL-08-4.1.1  
PL-08-4.2.2

#### Reading

RD-08-2.0.4  
RD-08-2.0.6  
RD-08-3.0.2  
RD-08-3.0.4  
RD-08-4.0.1

#### Writing

WR-08-2.3.3  
WR-08-3.5.3

### OBJECTIVES

The student will:

-define ecosystem in nature by comparing them to familiar organizational structures.

-demonstrate understanding of the concepts of interdependence and interrelation by participating in a problem-solving exercise to determine group and individual responsibility for protecting and conserving natural resources.

-identify some common ecosystems from which we obtain different agricultural products.

-develop solutions to complex modern problems by utilizing group problem solving techniques.

### CONCEPTUAL AREA

Awareness and appreciation—survival is dependent upon how well people manage natural resources.

Decisions-responsible human decisions are necessary to maintain food and natural resources.

**RESOURCES**

The background information for this lesson was adapted from the Minnesota Agriculture Magazine, Volume 5, Issue III, 1990-1991.

**EVALUATION**

Student’s understanding of these concepts presented in this lesson can be assessed by constructing a group activity where specific agricultural products are listed and the students can identify the ecosystem from which we obtain that product. Some examples would be: milk-farm, pastureland; fish-lake or river; bread-wheat, field; orange juice-citrus grove; pineapple-tropical field; lumber for a house-forest; beef steak-western rangeland, farm; cranberries-bog; potato-field; cotton shirt-cotton field. For each example have students list and describe some adverse conditions for obtaining that agricultural product from it’s ecosystem. Examples: orange juice-hurricane, fish– manufacturing contamination of lake or stream; potato-infestation of Colorado potato beetle; forest-wildfire.



# Spider Map

