

Introduction to Environmental and Agricultural Science

Lesson Planning Guide

#	Lesson Title	45 min. Class Periods	Lesson Overview	Tools, Equipment, and Supplies	Prior Preparation
UNIT A: What is Environmental and Agriculture Science (Introduction Unit)					
A1	History of Environmental and Agricultural Systems	2	Students take notes and read articles about how life changed for humans because of the introduction of agriculture. Students play "MasterMind" using the dates of significant changes in agriculture and complete a worksheet while researching historical events that have impacted agriculture.	Blank Printer Paper, Markers, Writing Surface, Activity Sheet 1: enough for ½ the class, Activity Sheet 2: enough for ½ of the class, Activity Sheet 3 & 4: enough for 1 copy per team of 2 or 3 students, Activity Sheet 5: 1 per student, Computer or computer lab capable of playing audio with access to the internet (http://agclassroom.org/gan/media/program.html) or the "Growing a Nation" CD-ROM.	Test to be sure the Growing a Nation will work on your computer. Sound is necessary.
A2	Role of Environmental and Agricultural Systems	2	Objective 1: The learner will understand the role agriculture plays in determining the wealth of a nation. Objective 2: The learner will document the role agriculture played in American history. Objective 3: The learner will describe the impact environmental and agricultural systems will have on the future world population.	2 dice, 1 large (1/2 to 1 lb.) package of M&M's®, Dixie cups (1 for each student), "Free Trade" Worksheet for each student, "Agriculture's Role in History: Who's in the Know" Interview Rubric "SAMPLE INTERVIEW QUESTIONS For Agriculture's Role in History: Who's In the Know"	
A3	Biotechnology in Environmental and Agricultural Systems	5	This lesson presents an overview of the Food Science Industry. Learners will learn about proper nutrition, create informational flyers on food-borne pathogenic organisms, and create their very own food product label.	Activity Sheets 1 (Make-Your-Own-Sauerkraut PDF) and 2 (1 each per student), Assessment, Assessment Key, Biotechnology PowerPoint, Jeopardy Game PowerPoint See Activity Sheets 1 and 2 for	

				supplies needed.	
A4	What are Environmental and Agricultural Careers?	2	This lesson presents an overview of careers in the Environmental and Agricultural field. Learners then complete a career report over one career in the Environmental and Agricultural Field.	Computer with projector to view PowerPoint. Computer lab with internet access for career report. Activity Sheet 1 (1 per student), Activity Sheet 2 (1 per student).	
UNIT B: Introduction to Agribusiness Systems					
B1	Leadership & FFA	5	Students will gain a general understanding of FFA History, opportunities, and procedures, as well as a general knowledge about Agricultural Education through various structured activities.	Blank sheets of paper, one (1) Student Handbook for each student, a list of the classes you offer, slips of paper with dates on it, baggie (or something to put the slips of paper in), scissors to cut the slips apart, Quiz, slips of paper with essentials on it for role playing, one (1) large note card for each student	
B2	Defining SAEs	2	This lesson presents an overview of Supervised Agricultural Experiences. Students create a brochure about their SAE and learn about proficiency awards.	Computers with web access for brochure development, Attached overheads, Activity Sheet 1 & 2 (1 per student).	
B3	Public Speaking	5	Students learn public speaking techniques with opportunities to learn The FFA Creed integrated throughout the curriculum. Students will be introduced to the techniques and continuously rehearse the techniques. By the end of the lesson, students have the opportunity to stand and deliver The FFA Creed to their class. This lesson plan is designed so that teachers may use it at the beginning or end of a class period and still cover other curriculum in the class.	FFA Student Handbook, Activity Sheet 1, 2, 3, 4, 5, 6 (one copy per student, each).	This lesson is designed to be taught as part of several classes. The individual class breakdowns are: (3) 25-30 minute lessons; (1) 45 minute lesson; and (1) 15 or 45 minute lesson.
B4	Parliamentary Procedure	5	Learners will establish awareness about parliamentary procedure, interact with parliamentary procedure leadership skills event procedures, and practice using parliamentary procedure.	Robert's Rules of Order, Newly Revised, FFA Student Handbooks, The FFA Manual, Student Worksheets 1-4 (1 per student), Pedigrees and Precedence worksheet (1 per student), Student Crossword Puzzle worksheet (1 per student), scratch paper, copy of event rules (1 per student), sample event test, paraphernalia, event evaluation	

				forms	
B5	Budgeting Income and Expenses	1	This lesson presents a brief overview of budgeting and tracking income and expenses within a SAE program or project.	Nebraska SAE Record Book, included PowerPoint, Activity Sheet 1 (1 per student), included video clip entitled "Interest Approach".	
B6	Using Assets and Liabilities to determine Net Worth	2	This lesson presents an overview of the key components in determining net worth. Learners then complete a personal balance sheet as well as an activity/assessment.	Nebraska SAE Record Book, Activity Sheet 1 (1 per student), Activity Sheet 2 (1 per group or 8-10), Activity Sheet 3 (1 per student).	
B7	SAE Record Keeping Applications				
B8	Attitude, Character, and Ethics in the Workplace	2	This lesson will serve as an overview of the motivation, values, and principles necessary to enhance character and leadership development.	Activity Sheet 1 (1 per student), Activity Sheet 2 (1 per student).	
UNIT C: Introduction to Power, Structure, and Technical Systems					
C1	Safety in Agriculture	3	This lesson is an overview of the general safety practices to be followed in the agriculture education laboratory.	Rake; Computers with internet access for MSDS search, Activity Sheets 1-4 (1 per student), Assessment 1 (1 per student).	
C2	Units of Measure	1	This lesson presents an overview of the various measurement systems used in the agricultural mechanics industry. Students will practice converting various measurements to other units of measure.	Textbooks, Activity Sheet 1 (1 per student), writing utensils, length measurement devices (steel tapes, rulers).	
C3	Measuring Devices	2	This lesson presents an overview of the various measuring devices used in the agricultural mechanics industry. Students will practice using several measuring devices to take measurements in the agriculture mechanics laboratory.	Textbooks, Activity Sheet 1, Assessment 1, Writing Utensils, Measuring Devices (Steel Tapes, Rulers, Framing Square etc.) scissors, string.	
C4	Hand Tools	1	This lesson presents an overview of hand tools and their use in Environmental and Agricultural Science.	15 types of hand tools (bevel, steel tape, handsaw, cold chisel, tin snips, round file, tap wrench, twist drill, c-clamp, etc), Activity Sheet 1 (1 per student).	
C5	Portable Power Tools	3	This introductory lesson presents an overview of the various portable power tools used in the agricultural mechanics industry. Students will identify and demonstrate precautionary safety practices while using portable power tools after correctly identifying and classifying power tools.	Computers with internet, Laminator, Safety glasses, Examples of Portable Power Tools, Activity Sheet 1 (1 per student).	

C6	Stationary Tools	3	This introductory lesson presents an overview of the various Stationary power tools used in the agricultural mechanics industry. Students will identify and demonstrate precautionary safety practices while using Stationary power tools after correctly identifying and classifying power tools.	Safety Video downloaded or free DVD on hand, Computer Lab for research, Stationary power tools Blue paper to tape to Stationary tools in lab. Field note guide.	
C7	Oxy-fuel Welding and Cutting	4	This introductory lesson presents an overview of the applications associated with the oxy-fuel welding and cutting processes. Learners will be exposed to the equipment associated with the process as well as the fundamentals and applications necessary to accurately weld and cut using the process. <i>This lesson should only be used if the instructor has previous experience in oxy-fuel welding. The instructor must add additional safety protocols associated with the manufacturers of the equipment and school guidelines.</i>	Oxy-Fuel Welding units, gas, tips, cutting tips, 1/8" mild steel, Safety glasses, gloves, leathers, and #5 shade goggles, Strikers, filler rod, Sticky notes. Victor Safety video	
C8	SMA Welding	12	This introductory lesson presents an overview of the applications associated with the shielded metal arc welding process. Learners will be exposed to the equipment associated with the process as well as the fundamentals and applications necessary to accurately weld using the process. <i>This lesson should only be used if the instructor has previous experience in shielded metal arc welding. The instructor must add additional safety protocols associated with the manufactures of the equipment and school guidelines.</i>	SMAW Units, 1/8" or thicker mild steel, Safety glasses, gloves, leathers, and welding helmets, 1/8" electrodes, chipping hammers, 4 " x 4" piece of cardboard, a ruler and a tube of toothpaste, examples of the five types of weld joints, labels of joint names.	

UNIT D: Introduction to Plant Systems

D1	Industries within Plant Systems	1	This lesson presents an overview of the seven areas of Plant Systems. Learners then complete a career report over one career from Plant Systems.	Plant materials for interest activity, computers with internet access for career report, Activity Sheets 1 and 2 (1 each per student).	Plant materials may be obtained in advance.
D2	Plant Structures	4	This lesson presents an overview of the importance of plants; the main parts of a plant; the types of each of the plant parts; and the relationship of each part to fruits, nuts, and vegetables.	One copy of each of the plant part names to place on wall; Activity Sheets 1-5 (1 per student), scissors, glue, and colored pencils for each student; fruit and vegetable samples (provided by students or you); Assessment 1 (1 per student).	Fruit and vegetable samples must be collected in advance.
D3	Plant Physiology	4	This lesson covers plant processes including photosynthesis, respiration, and transpiration.	Computer, LCD, Handouts, Interest Approach Supplies (pots, 10 corn seeds, potting	Prepare materials for the corn growing activity in advance.

				soil), Activity Sheet 1-3 (1 per student), Photosynthesis and/or Respiration Video (optional), Lab supplies (optional)	
D4	Plant Reproduction	3	This lesson presents an overview of how plants are propagated. Upon completion of this unit students will know how to propagate plants both sexually and asexually.	Activity Sheet 1-2 (1 per student), Seeds (Monocot/Corn and Dicot/Soybeans), Paper Toweling, Clear container(s), Water, Model – (picture) of a complete flower – Florist or garden flowers will work ex. – Lilies, Stock Plants for asexual Propagation – Swedish Ivy, Wondering Jew, Golden Pothos, 6 inch Azalea Pot, Tape, Permanent Marker, Growing Medium for each pot, a clear plastic bag for each pot, Rooting hormone.	See tool list and activities for advance preparation. The lesson can be taught without all supplies.

UNIT E: Introduction to Food Products and Processing Systems

E1	The Food Industry	2	This lesson presents an overview of the major food commodity groups, different operations, and careers within the food industry.	One poster board or freezer paper per small group, markers, various food products processed in the state (provided by you or students), one tri-fold display board per two or three students, computers with Internet access and colored printers, scissors, glue, and Assessment 1 and Activity Sheet 1 (1 per student).	Have students bring food products by announcing the assignment in advance.
E2	Food Science	2	This lesson presents an overview of the Food Science Industry. Learners will learn about proper nutrition, create informational flyers on food-borne pathogenic organisms, and create their very own food product label.	Computers with internet access for Most Unwanted Organism Flyer, crayons, markers, and other art supplies for the product development activity, Activity Sheets 1-7 (1 per student).	

UNIT F: Introduction to Animal Systems

F1	Animal Anatomy, Physiology, and Nutrition		Upon completion of this unit learners will be able to understand the importance of nutrition in the livestock industry and the differences between species in terms of anatomy, physiology, and nutrient requirements and/or deficiencies.		
F2	Animal Health	4	Upon completion of this lesson, students will identify	Activity Sheets 1-3 (1 per	See the

			signs of good health and symptoms of poor health, as well as understand preventive measures and treatment options for animals under their care.	student), Agriscience Lab Manual – Exercise 39, Agriscience Lab Manual – Exercise 41, Agriscience Lab Manual – Exercise 42, PowerPoint Presentation or Actual Equipment, Reading Drug Labels Worksheet, Drug Labels and/or Boxes	Agriscience Lab Manual and the lesson for Lab-specific supplies.
F3	Genetics, Breeding, and Reproduction	4	This lesson presents an overview of the role of genetics, breeding, and reproduction in animal agriculture.	Computer, Multimedia Projector, Activity Sheet 1 (1 copy of Unit Notes Outline per student), Activity Sheet 2 (1 per student), Teacher Sheet 2 (1 copy– cut apart), 2 “somethings” to draw genes from, colored pencils, Activity Sheet 3 (4 copies of each cow picture horned and polled), Activity Sheet 4 (1 per student), and Assessment 1 (1 per student).	
F4	Food Animal Management	2-7	Upon completion of this lesson learners will understand the historic and economic implications of the livestock industry to our state and nation. Learners will also recognize the best management practices for the food animal species; as well identify the important breeds of each species.	Computer, LCD Projector, Activity Sheet 1-6 (1 per student).	Review this lesson in advance. Many teachers will want to piece it out based on student interest.
F5	Horse Management	3	This introductory lesson presents an overview of the horse industry including classification, breeds, colors, tack and history of horses used in the United States.	Computers with internet, Laminator, Agriscience books, projector, Activity Sheet 1 (1 per student).	
UNIT G: Introduction to Natural Resource Systems					
G1	Introduction to Natural Resource Systems	2	This lesson presents an overview of Natural Resources. Learners then complete a poster identifying and classifying Natural Resources.	Construction Paper, Scissors, Glue/Rubber Cement, Farm/Old Magazines, Included PowerPoint, Activity Sheet 1-2 (1 per student), Assessment 1 (1 per student).	
G2	Air Quality	2	Learners will identify sources of air pollution, explain the greenhouse effect, and detail procedures for improving and maintaining air quality.	Stop watch, quart jar with lid, thermometer, poster board, markers, magazines that pictures can be cut from, scissors, tape or glue, Activity	

				Sheet 1 (1 per student), Activity Sheet 2 (1 per student).	
G3	Water and Soil Conservation	3	Students learn about the relationship between land and water, potential threats to water, soil erosion factors, and conservation of both resources. They perform an in-depth activity to experience pollution and take a quiz.	Earth as an Apple activity (Apple, Knife, World Map, Labels, Pie Chart), crayons or markers, Activity Sheet 1 (1 per student), Teacher Sheet 1, Activity Sheet 2 (1 per student), Who Dirtied the Water supplies (22 Dixie Cups, 22 Rubber Bands, 6 Paper Towels, Felt Tip Marker, 1 Large Jar filled ½ full with Tap Water, 1 Stir Stick, small samples to fill Dixie cup ¼ full of: wood chips, sand, charcoal, dried grass, crushed shells/shell macaroni, organic garbage, nails, potting soil, nylon fishing string, toilet paper, colored paper, newspaper, plastic pieces from a pop bottle, Styrofoam, powdered detergent, engine oil, molasses, vinegar).	Prepare, or have a Teacher assistant prepare, the Who Dirtied the Water supplies in advance.
G4	Soils Management	3	This lesson presents an overview of soil management. Students will evaluate soils samples for capability, physical characteristics and texture.	Soils PowerPoint, Activity Sheet 1 – Sedimentation Lab (1 per student), Activity Sheet 2 – Terms (1 per student), Activity Sheet 3 – Power Point Skeleton Notes (1 per student), Activity Sheet 4 - Texture Triangle (1 per student), Assessment 1 (1 per student), Samples that include, 2- 5 quart plastic ice cream buckets each of sand, silt and clay, 2-3 random samples, Styrofoam or paper plates, Rolling Pin (used to fracture clay and silt particles), 8% Calgon Solution, Measuring Cups, 4 Quart jars with lids, Metric Ruler, Tablespoons.	Laboratory supplies should be prepared in advance.
G5	Forest Management	2	This lesson presents an overview of ecosystems of a forest. Upon completion of this unit students will know the dynamics of forestry management.	Forestry Power Point, Activity Sheet 1 (1 per student), Activity Sheet 2 (1 per student),	May choose to purchase “ <u>What Tree is That?</u> ” The

				Assessment 1 (1 per student), Forest products- leaves, cones, wood, branches, 10 Examples of trees or tree mounts – You may need multiple examples for the identification lab.	National Arbor Day Foundation – 1-888-448-7337. (\$3.00 + SH 35 for \$25 + SH)
G6	Wildlife Management	3	This lesson presents an overview of Wildlife Management. Learners will identify characteristics of wildlife, relationships between wildlife, identify approved practices in wildlife management and research a wildlife animal.	Activity Sheets 1, 2, & 3 (one per student, each), Activity Sheet 4 (optional—one per student), Assessment 1 (one per student), note cards (3-5 per student), accompanying PowerPoint.	
UNIT H: Introduction Environmental Service Systems					
H1	Sources and Groups of Environmental Pollutants	4	This lesson presents an overview of the sources, groups, and types of pollutants affecting the environment. In addition, learners will take an active part in being the “pollution solution” rather than the problem.	TV, VCR, Computer, Multimedia Projector, Internet, Video Cameras, Recordable Tapes or DVDs for Cameras, Activity Sheet 1 (1 per student), Assessment 1 (1per student), Assessment 2 (1 copy per student).	
H2	Careers within Environmental Health	1	This lesson presents an overview of the careers available within Environmental Health.	Computers with web access for newspaper development, Activity Sheet 1 (one per student), Activity Sheet 2 (one per student).	