

COMMON SAES & RELATED SKILLS/PROFICIENCIES

E=ENTREPRENEURSHIP

P=PLACEMENT

1. BEEF PRODUCTION-E/P

- a. do adjusted weaning weights for selecting herd replacements
- b. rate of gain
- c. feed conversion rates-----lbs of feed to make a pound of gain
- d. contracting market steer sales
- e. veterinary skills such as vaccination, castration, hoof work
- f. practices such as fly control, lice and mange treatment
- g. selecting breeding stock for the herd (bulls and replacement heifers/cows)
- h. artificial insemination
- i. feeding and mixing rations
- j. keeping records
- k. registration of purebred animals/membership in breed associations
- l. record keeping
- m. feed conversions and rates of gain

2. DAIRY PRODUCTION-E/P

- a. artificial insemination
- b. reading and interpreting all production records as well as taking milk samples
- c. use of records to select heifer replacements
- d. feeding and using TMR's in the herd feeding program
- e. sire selection and genetic mating skills to improve production and type
- g. milking procedures
- h. sanitation in the milk house and during milking
- i. all veterinary procedures such as vaccination, treating mastitis, giving shots, etc.
- j. raising heifers
- k. contracting milk
- l. registration of purebred animals/breed association membership
- m. record keeping

3. SWINE PRODUCTION-E/P

- a. artificial insemination
- b. veterinary skills such as clipping needle teeth, castration, vaccination, clipping tails. Etc.
- c. boar and gilt selection
- d. mixing rations and feeding different age groups of swine
- e. contract sales of market hogs and other marketing methods
- f. breeding systems such as rotational crossing to maximize heterosis
- g. identification methods such as earmarking
- h. registration of purebred animals/breed association membership
- i. use of practices such as measuring loin eye
- j. showmanship skills to enhance possible sale of breeding stock
- k. record keeping
- l. feed efficiency and rates of gain

4. GRAIN PRODUCTION-E/P

- a. soil testing and reading the results
- b. using soil test results to develop a fertility program
- c. moisture testing
- d. use of no-til vs conventional tillage methods the results
- e. disease and insect recognition/treatment
- f. obtain your pesticide certification license
- g. running the dryer for drying the grain
- h. operating the storage facility
- i. obtaining your commercial driving license (CDL) to haul grain to market
- j. marketing programs
- h. use of genetically modified seeds and its benefits
- i. yield measuring
- j. record keeping

5. TURF GRASS MANAGEMENT-E/P

- a. different lawn mowing techniques
- b. care of machinery and equipment
- c. soil testing of lawns
- d. reading/interpreting soil test results to make recommendations
- e. establishing lawns
- f. selecting the right varieties of grass seed for different lawns
- g. recognizing disease and insect problems of lawns
- h. use of other lawn tools such as an edger, leaf blower, aerator, etc.
- i. basic pruning of lawn shrubs
- j. disposal of lawn clippings (bagged and removed or mulched)
- m. record keeping

6. AGRICULTURAL COMMUNICATIONS-E/P

- a. writing newsletter articles for your chapter
- b. maintaining the chapter scrapbook
- c. writing and mailing thank yous for chapter donors
- d. establishing and maintaining chapter databases involving
 - donors
 - membership
 - sales records
 - chapter activities
- e. creating a webpage for the chapter
- f. being editor of the chapter newsletter (quarterly and for FFA Week)
- g. writing news releases for chapter activities sent to the paper
- h. giving presentations to area groups such as the Chamber of Commerce, Kiwanis, etc.
- i. handling the mailing of all chapter business communications
- j. doing a weekly or bi-weekly update of chapter activities for the administration
- m. record keeping

7. FRUIT PRODUCTION-E/P

- a. laying out the garden/field/orchard
- b. getting a pesticide application license and applying pesticides
- c. establishing new plantings or trees (variety selection)
- d. pruning trees
- e. harvesting and preparing for sale
- f. packaging
- g. marketing (setting up roadside stands, delivering to groceries, wholesale contracts)
- h. contacting potential customers
- i. tillage and weed control
- j. recognizing disease and insect problems
- k. advertising
- l/ record keeping

8. NURSERY PRODUCTION-E/P

- a. pruning for developing saleable nursery stock
- b. disease and insect identification
- c. irrigation knowledge
- d. propagation of perennials
- e. obtaining a pesticide certification license
- f. use of fertilizers
- g. harvest of nursery stock in the fall and spring
- h. working in sales in the nursery plant yard
- i. tagging and identification of nursery stock
- j. maintaining nursery equipment
- k. identifying common nursery stock
- l. customer assistance in nursery stock selection and care
- m. knowledge of how to care for harvested nursery stock
- n. record keeping

9. LANDSCAPE MANAGEMENT-E/P

- a. identification of plants and trees selected for landscape projects
- b. characteristics of plants selected for a landscape project
- c. ability to operate equipment used in landscaping
- d. repair and maintenance of landscape equipment
- e. drawing the landscape plan/computer assisted landscape drafting programs
- f. selection of landscape materials other than plants; timbers, bricks, a trellis, etc.
- g. figuring a bill of materials/doing estimates for landscape jobs
- h. soil testing and interpreting the results
- i. establishing a lawn
- j. communication with customers
- k. ability to survey a lot or any area and read the plat books to make sure the property is correctly laid out
- l. record keeping

10. VEGETABLE PRODUCTION-E/P

- a. variety selection
- b. obtaining your pesticide license
- c. Identification of diseases and insects
- d. use and care of equipment used in vegetable production
- e. harvesting vegetables
- f. preparing vegetables for market
- g. laying out the garden or fields where vegetables are grown.
- h. marketing the crop-----direct markets, roadside stands, contracting
- i. soil testing and interpreting the results
- j. communication/sales skills
- k. advertising
- l. tillage, weed control, use of mulches
- m. record keeping

11. FLORICULTURE-E/P

- a. cutting flowers
- b. arranging flowers
- c. preparing displays
- d. flower identification
- e. knowledge of flowers and how they fit into displays
- f. growing a flower crop and the associated skills
 - soil testing
 - tillage
 - times to cut the flowers
 - operation of flower garden equipment
 - pest control
 - identification of pests—diseases, insects, fungus, etc
- g. drying flowers
- h. sales/marketing skills
- i. communication
- j. record keeping

12. EQUINE SCIENCE-E/P

- a. record keeping
- b. grooming
- c. exercising horses
- d. training horses
- e. care of feet and legs
- f. feeding
- g. selecting mares or stallions in the breeding program
- h. all minor veterinary practices
- i. care of all tack items (includes repair/oiling/inventory)
- j. maintain medical inventory and logs
- k. communication
- l. riding safety
- m. assist with foaling
- n. riding skills
- o. horse show competitions

13. POULTRY PRODUCTION-E/P

- a. record keeping
- b. disease and pest identification
- c. poultry health problems
 - preventive measures
 - treatments
- d. feeding of different poultry types
 - meat animals
 - laying animals
- e. breed selection
- f. housing of poultry (types)
- g. organically raised poultry as a niche market
- h. feed conversions/ration formulations
- i. egg production records
- j. marketing
 - home slaughter and use
 - commercial marketing
- k. processing methods
- l. advertising
- m. meat type chickens vs laying enterprises
- n. customer contacts
- o. advertising

14. AGRICULTURAL SALES-E/P

- a. inventory
- b. running the cash register
- c. direct sales contact with customers
- d. communication
- e. knowledge of the business and products
- f. work attendance
- g. knowledge of all machinery operation in the business
 - passed all safety tests
 - maintain and repair
- h. display set up
- i. making signs
- j. company records
- k. handling money and banking
- l. making change
- m. product pricing
- n. receive and store sales inventory
- o. computer use
- p. input on sales flyers/advertising
- q. good telephone skills
- r. understand and use product manuals
- s. keep store/cooperative work areas clean
- t. ability to listen and explain
- u. knowledge of other companies in the same business
- v. financial records
 - net worth statements
 - balance sheets
 - depreciation schedules
 - cash flow projections
 - reconciliation of daily/weekly/monthly receipts
- w. bills of lading
- x. invoicing

15. HOME AND/OR COMMUNITY DEVELOPMENT-E/P

- a. map and identify community resources
- b. inventory community and home improvement areas
- c. volunteer for work with the Chamber of Commerce
- d. plant trees/shrubs where the village governing body would like them
- e. paint/repair park equipment
- f. volunteer work for helping organizations in the community
 - chaperone girl scout and boy scout outings
 - spend time working at the area nursing home
 - assist day care workers with children's games
 - work with other high school groups in their activities
- g. road side clean up volunteer
- h. assist community in times of disaster
 - floods
 - fires
 - snow damage
 - tornado and other wind damage
 - other storm clean up
- i. repair and paint your home and buildings
- j. create play areas in the park
- k. approach village governing body about new projects for the community and volunteer to work in their completion
 - horse shoe pits for the park
 - new volleyball courts
 - new tennis courts
 - new playground equipment
- l. create community flower beds and ask each community group to tend one
- m. create raised flower beds or raised garden beds for the area nursing home so the residents in wheel chairs can access them
- n. as part of the FFA, chair the creation of a chore corps to help people in need of services they can not perform themselves
- o. do street and park clean up chores
- p. build park and street benches for your community
- q. build flower containers for village businesses
- r. soil test the park for your community and prepare a report for the village governing body with respect to fertilizer recommendations
- s. volunteer to paint fire hydrants for your community
- t. landscape the library or other public place in your community
- u. landscape your home
- v. create a nature trail with signs regarding plants and animals in the area
- w. make or redo a sign for your village identifying it
- x. volunteer to create a webpage for your community
- y. rewire an older building on your farm or at your business
- z. create a long range plan for your home or community regarding possible improvements

16. ENVIRONMENTAL SCIENCE AND NATURAL RESOURCES MANAGEMENT-E/P

- a. create a farm pond or duck scrape
- b. plant wildlife vegetation to increase habitat for wildlife species in your area
- c. keep records on all projects for this SAE
- d. do water testing to determine oxygen content, pH, nitrate contents
- e. identify wildlife species in the area you work with in this SAE
- f. identify wildlife tracks
- g. do a game census for your land area
- h. learn to operate land shaping equipment such as a tractor and blade, a bulldozer, etc.
- i. do land measurements to determine acreage
- j. take a soil sample on the land
- k. identify plant species which fit the animals in the area
- l. build and install bird houses
- m. learn to use a transit for reading land elevations
- n. create a long range plan for improving the area
- o. meet with related professionals for input regarding your plan
 - game warden
 - extension professionals on land reclamation, soils, and crops
 - department of natural resources
- p. make brush piles for wildlife habitat
- q. plant wildlife food plots
- r. establish prairie areas and plant them with native vegetation

17. AGRICULTURAL MECHANICS DESIGN & FABRICATION-E/P

- a. learn to operate all shop power equipment
- b. repair and maintain all equipment in the shop
- c. learn about how to install a wire harness
- d. learn to read blue prints
- e. be skilled at reading all measuring equipment
- f. be skilled in working with different metals and know their properties
- g. be safety certified on all shop equipment
- h. do not work alone in the shop, if at all possible
- i. be skilled at all welding types
- j. know how to use all hand tools in the shop
- k. understand and maintain the shop's inventory
- l. field test all equipment designed for farm use
- m. wear proper safety equipment
- n. maintain a record of all shop work completed by using a good record book

18. SMALL ANIMAL PRODUCTION AND CARE-E/P

- a. practice sanitation for all animals in your care
- b. learn to give shots and vaccinations
- c. trim dog nails
- d. exercise pets
- e. teach dog and/or other pet obedience
- f. assist with surgery prep-veterinary clinic
- g. assist with surgery-veterinary clinic
- h. be able to identify animal parasites
- i. know the rations needed for each age group of pets
- j. handle inventory items in the pet store or clinic where you work
 - price items
 - stock shelves
- k. handle cash transactions for purchases and be able to answer product questions from customers
- l. identify breeds of small animals and know their characteristics
- m. become skilled in lab work areas such as autopsies for animals that died
- n. be able to invoice customers for a purchase in a pet store or vet clinic
- o. practice communication skills for working with customers
- p. become skilled in animal disease and parasite diagnosis
- q. be able to package samples sent into the state health lab for special diagnosis assistance
- r. work with special animal projects such as training companion animals
- s. keep good records in all areas; your own pets and your work at a veterinary clinic or pet store
- t. have good work attendance

19. AGRICULTURAL SERVICES-E/P (2 examples)

- COMMERICAL HEIFER RAISING-P**
- a. prepare contracts with the farmers served
 - b. do minor veterinary practices on all heifer calves
 - remove extra teats
 - dehorn
 - treat lice/mange problems
 - give shots
 - vaccinations
 - treat foot and leg problems
 - c. balance rations
 - d. sire selection for breeding heifers
 - e. learn artificial insemination
 - f. sanitation procedures
 - g. mixing milk replacer
 - h. use of calf hutches to lessen disease/sickness
 - i. grouping calves by size when raising them
 - j. calf identification techniques
 - k. forage test all hay for feed analysis
 - l. maintain good records
 - m. practice good safety habits
 - n. use rotational grazing
 - o. measure and layout grazing fields
 - p. advertising
 - q. customer relations
 - r. equipment maintenance and repair
 - s. fencing skills (regular fencing & electric)
 - t. obtain a CDL (Commercial Driver's License)
 - u. become skilled in purchasing supplies
 - veterinary discounts
 - bulk purchasing for discount pricing
 - v. daily checking of all heifers
 - health problems noted quicker
 - heifers in heat detected better

- MANURE HANDLING BUSINESS-E**
- a. prepare & sign customer contracts
 - b. know manure fertilizer values
 - c. equipment repair and maintenance
 - d. equipment fabrication
 - e. customer relations
 - f. develop cash flow projections
 - g. set prices per gallon of manure pumped
 - h. estimating gallons of manure per pit
 - i. incorporating manure
 - j. proper agitation of manure before pumping
 - k. estimating cost per gallon to pump manure
 - l. maintain an inventory of supplies for the business
 - m. ordering supplies
 - n. advertising the business
 - referrals
 - flyers
 - ad layouts
 - ads in state ag newspapers
 - o. prepare balance sheet
 - p. prepare net worth statement
 - q. prepare information for tax preparation
 - r. develop and update business plan
 - s. use financial information for meetings with the banker regarding loans
 - t. preparing payroll information for employee wages
 - u. handling employees
 - v. safety instruction
 - equipment operation
 - manure gas dangers
 - posting instructions on equipment operation
 - w. scheduling work
 - equipment for each job
 - employees on each job
 - x. set up and take down for each manure pumping job
 - y. knowledge of manure handling regulations in your state
 - z. invoicing

20. WILDLIFE MANAGEMENT-E/P

- a. doing a game census
- b. planting wildlife shrubs
- c. planting trees
- d. creating brush piles for wildlife cover
- e. land measuring skills to determine acreage
- f. identification of wildlife species
- g. identification of wildlife signs
 - tracks
 - deer rubs
 - deer scrapes
 - nesting areas
 - bedding areas
- h. knowledge of wildlife characteristics
 - nocturnal or diurnal
 - mating habits
 - food requirements
 - ranges of each wildlife species
- i. having your hunter safety certificate
- j. animal population control methods
 - hunting
 - trapping
 - stocking pheasants/quail/wild turkeys
- k. knowledge of all hunting rules/regulations
- l. firearm and archery safety
- m. identification of plant species in the area
- n. establishing wildlife food plots
- o. banding released pheasants for identification purposes
- p. feeding young raised wildlife
 - pheasants
 - quail
- r. disease and pest identification
- s. soil testing to establish cover with better success
- t. fencing for young raised wildlife birds
- u. posting land for no trespassing
- v. use of equipment in planting, mowing, and care of wildlife habitat

21. SHEEP PRODUCTION-E/P

- a. breed identification
- b. characteristics of the breeds in your flock
- c. use of crossbreeding programs to improve lamb performance
- d. ram and ewe selection
- e. mixing rations
- f. marketing methods
 - market lambs
 - breeding stock
 - show lambs
- g. identification methods
- h. registration of purebred animals
- i. checking carcass performance from fair animals
- j. showmanship skills to enhance possible sale of breeding stock
- k. record keeping
- l. selling wool as a value added product of this SAE
- m. shearing sheep
- n. figuring rates of gain
- o. figuring feed conversion rates
- p. balancing rations for different age groups and classifications of animals
 - breeding stock
 - market lambs
 - gestating animals
- q. membership in breed associations

22. OUTDOOR RECREATION-E/P (two examples)

POOL WORKER

- a. inventory of pool supplies
- b. giving swimming lessons
 - different swimming strokes
 - how to float
 - life saving
- c. doing water sampling
 - pH
 - chlorine content
 - bacteria content
- d. collecting and recording fees
- e. setting up pool games
- f. closing the pool
- g. adding chlorine to the pool water
- h. reading pool house gauges for
 - leakage/other problems
- i. equipment repair and maintenance
- j. establishing pool games for young swimmers for recreational swimming
- k. life guard certified
 - Level I
 - Level II
- l. posting rules
- m. people skills for maintaining order
 - problem solving
 - setting rules
 - removing rule violators

CAMPGROUND DIRECTOR/YOUTH COUNSELOR

- a. inventory of campground supplies/equipment
- b. setting rules
- c. establishing camp games/activities
 - hiking
 - swimming
 - horseback riding
 - camp games such as volleyball/softball/etc
- d. winter camp activities
 - skiing
 - snowboarding
- e. night camp activities director
- f. safe boating instruction
- g. knot tying
- h. rock climbing
- i. building a camp fire
- j. communication of rules
- k. plant and animal identification
- l. minor repairs to camp equipment
- m. opening/closing camp areas
 - stables
 - boat house
 - pool
 - hiking trails
 - rock climbing wall
- n. camp record keeping
- o. attendance/participation records

23. SPECIALITY ANIMAL PRODUCTION-E/P

RAISING ELK

- a. bull and cow breeding stock selection
- b. mixing rations
- c. building fences
 - height of fence
 - double fencing to prevent outside contact
- d. tagging/identification of elk calves
- e. artificial insemination of elk cows
- f. selecting calves for herd replacement animals
- g. taking hair samples for DNA verification of parentage for registration
- h. registering animals with the breed association
- i. safety precautions when working with elk
 - bulls temperament
 - aggressive cows with calves
- j. record keeping in all areas of the operation
- k. antler harvest
 - handling the velvet at harvest
 - storing the velvet to maintain quality
- l. marketing elk and velvet
- m. assisting the elk cows at calving
- n. chronic wasting disease prevention
- o. knowing all rules/regulations regarding raising elk
- p. join North American Elk Association
- r. use of breeding/handling chutes
- s. equipment maintenance/repair

24. FIBER AND/OR OIL CROP PRODUCTION-E/P (2 examples)

PEPPERMINT/SPEARMENT OIL PRODUCTION

- a. field tillage operations
- b. soil sampling
- c. disease and insect identification
- d. become pesticide certified
- e. spraying
- f. cutting and raking the mint
- g. chopping the mint plants
- h. distilling the oil
- i. storage of oil before selling
- j. contracting the mint oil
- k. propagation of mint stands
- l. multiple crops in one year
- m. repair and maintenance of equipment
- n. knowledge of boiler operation
- o. fabrication of specialized equipment
- p. use of irrigation to establish mint stands
on muck soils
- q. knowledge of muck soils and their
properties
- r. record keeping
- s. safety procedures

SOYBEAN PRODUCTION

- a. field tillage operations
- b. soil sampling
- c. disease and insect identification
- d. become pesticide certified
- e. spraying
- f. combining the crop
- g. drying the crop
- h. storage of the soybeans
- i. marketing
-direct sales
-contracting
- j. repair and maintenance of equipment
- k. record keeping
- l. safety in all areas
- m. crop rotation knowledge
- n. variety selection
- o. use of round-up ready varieties

25. FORAGE PRODUCTION-E/P

- a. establishing the stand
- b. tillage operations
- c. soil testing
- d. variety selection
- e. avoiding auto-toxicity (alfalfa)
- f. harvesting methods
-baling
-chopping
-silage
-grazing
- g. topdressing potash after first crop (alfalfa)
- h. proper harvest moisture for silage
(alfalfa/corn/other crops)
- i. forage testing for relative feed value
-hay
-silage
- j. machinery repair and maintenance
- k. establishing long range field plan
- l. marketing the crop
- m. establishing the fertility program
- n. figuring storage capacity
-trench silos
-upright silos
-hay mow storage
- o. using feed values for ration recommendations
- p. when to cut (every 28 days for alfalfa)
- q. disease and insect identification
- r. obtaining your pesticide license

26. SPECIALTY CROP PRODUCTION-E/P

SEED PRODUCTION-P

- a. planting the test plots
- b. keeping the varieties separated by identity
- c. establishing a working uniform population for all varieties
 - plant all plots at 44,000 plants per acre
 - thin all plots to 32,000 plants per acre
- d. producing replicated studies for each trait
- e. inoculating inbreds for tolerance to problems
 - smut/stalk rot/etc
- f. yield checks on the inbreds
- g. pollinating the corn using silk and tassel bags to keep the lines pure
- h. plot harvest
 - soybeans
 - alfalfa
 - clover
 - corn
- i. recording data on:
 - stalk and root lodging
 - yield
 - corn borer infestation
 - insect damage
 - disease infestations
- j. identification of disease and insect problems
- k. obtaining a pesticide certification license
- l. training new employees
- m. preparing for the field day
- n. putting in variety signs at the plot
- o. keeping records
- p. weeding the plots by hand where the spray didn't work
- q. assigning crew members to different jobs each day
- r. bagging seed at the warehouse
- s. tagging the seed bags
- t. storing seeds
- u. germination checks on harvested seed
- v. laying out the test plots at the demonstration plot
- w. working with genetically modified seed
- x. answering questions during the field day
- y. repair and maintenance of equipment used at the test plots

27.

DIVERSIFIED HORTICULTURE-E/P

- a. soil sampling
- b. laying out a garden or test plot
- c. planting nursery crops
- d. pruning nursery stock
- e. pruning fruit trees
- f. establishing lawns
- g. selecting grass seed for lawns
- h. taking cuttings in the greenhouse
- i. mixing soil for greenhouse flower production
- j. use of fungicides as protectants or eradicants
- k. obtain a pesticide license
- l. potting annual flowers
- m. designing baskets
- n. arranging cut flowers
- o. setting up displays in the garden center or in the nursery sales area
- p. sales
- q. identifying nursery, lawn, and flower species
- r. mowing lawns
- s. fertilizing lawns and gardens
- t. mixing fertilizers
- u. labeling plants
- v. potting trees
- w. working in the bare root room for storage of dormant perennials
- x. customer relations and answering questions
- y. sharpening mower blades
- z. repair and maintenance of equipment
- aa. use of irrigation equipment
- bb. identification of disease and insect problems
 - in the greenhouse, the field, and in lawns
- cc. record keeping skills
- dd. safety skills for pesticide use and equipment use
- ee. taking orders via phone at the nursery
- ff. computer skills in database work and entering orders
- gg. bagging seed at the nursery
- hh. propagation of perennials
- ii. contracting growing of nursery plants with other nurseries
- jj. training younger workers when being a crew leader
- kk. adjusting mower height for different lawn types
- ll. switching mowing directions to accent mowing jobs
- mm. use of hormones in plant propagation
- nn. selection of plants for landscaping projects
- oo. selection of landscaping materials for different jobs
 - colored rocks
 - tile
 - edging
 - large rocks
 - ornaments
- pp. invoice preparation
- qq. computerized drafting work for landscaping projects
- rr. giving tours of the nursery
- ss.

28. AGRICULTURAL REPAIR AND MAINTENANCE-E/P

- a. learn to operate all shop power equipment
- b. repair and maintain all equipment in the shop
- c. read blue prints
- d. be skilled at reading all measuring equipment
- e. be skilled in working with different metals and know their properties
- f. be safety certified on all shop equipment
- g. be skilled in welding
- h. know how to use all hand tools in the shop
- i. understand and maintain the shop's inventory
- j. field test all equipment designed for farm use
- k. wear proper safety equipment
- l. maintain a record of all shop work completed by using a good record book
- m. knowledge of small and large engine components
- n. maintenance procedures
 - changing oil
 - checking tire air pressure
 - all other fluids
 - check transmission
 - check radiators
- o. ability to cut metal
- p. ability to use a metal shear
- q. diagnose engine and machinery problems
- s. rotate tires

29. AGRICULTURAL MECHANICS ENERGY SYSTEMS-E/P

- a. learn about how to install a wire harness
- b. learn to read blue prints
- c. understand hydraulic principals
- d. ability to change hydraulic hoses
- e. ability to wire two and three way switches
- f. ability to install a fuse box
- g. ability to install an electrical panel
- h. ability to read amp meters and use electrical testers
- i. use safety in all areas of electrical work
- j. use safety in all areas of hydraulic work
- k. using all tools in electrical and hydraulic jobs
- l. install electrical switches and switch boxes
- m. know wire sizes for each job
- n. know the electrical load for wire types and sizes
- o. design a wiring set up for a building
- p. replace hydraulic hoses on tractors and equipment
- r. change ballasts in lighting systems
- s. maintain a record of all shop work completed by using a good record book

30. AQUACULTURE-E/P

- a. take pH readings on streams and in the aquaculture tanks in school labs
- b. take measurements for:
 - nitrate concentration
 - oxygen content
 - turbidity
 - water speed
- c. recognize fish and other aquaculture economic crops
- d. know the life cycle of aquatic animals
- e. know how mix and feed fish rations
- f. recognize aquatic plants and their contribution to the water ecosystem
- g. figure rates of gain for fish you grow
- h. figure feed efficiency for fish you grow
- i. be able to mark fish so you can record data on them as they grow
- j. use biofilters in aquaculture tanks
- k. set up and/or design an aquaculture system
- l. inventory all chemicals for maintaining fish tanks in the animal lab
- m. be able to process the fish you raise
- n. maintain records of all work related skills and times in this SAE

31. FOREST MANAGEMENT AND PRODUCTS

- a. maintain and repair all equipment in the harvest and processing of lumber
- b. use all equipment properly
- c. be able to estimate the lumber in a stand of trees
- d. be able to figure board feet
- e. recognize different wood types and know their properties
- f. understand block cutting
- g. ability to plant and care for new trees for reforestation
- h. keep accurate records
- i. practice safety in all areas
- j. know how to “fall a tree”
- k. dispose of all branches and stumpage

32. EMERGING AGRICULTURE TECHNOLOGY-E/P

- a. use of computer technology
 - databases
 - spreadsheets
 - word documents
 - publishing software
 - others
- b. use of internet for SAE sales or advertising
- c. working in a laboratory situation
 - soil testing
 - milk testing
 - biotechnology research
- d. following laboratory protocol
- e. use of microscopes
- f. soil testing process
- g. setting up laboratories for classes
- h. building laboratory systems
 - for alcohol synthesis
 - to separate chemicals
 - others
- i. use of GPS in agriculture
 - for fertilizer application
 - yield responses at different field spots
 - mapping fields
- j. live readings of backfat and loin eye areas from scanning market animals

33. FOOD SCIENCE AND TECHNOLOGY-E/P

- a. following laboratory protocols
- b. developing new flavors for products
- c. experiments in food preservation techniques
- d. analyzing components/make-up of food products
- e. testing milk for
 - solids
 - fat
 - protein
 - water content
- f. comparing data on new varieties with older varieties
- g. determining digestibility
- h. research on growth additives on market animal growth
- i. comparison of antibiotics on laboratory animals with disease/health problems

34. DIVERSIFIED LIVESTOCK PRODUCTION-E/P*

*combine the skills/efficiencies of two or more livestock areas such as beef, sheep, swine, buffalo, dairy, equine., poultry, or specialty animals

35. DIVERSIFIED CROP PRODUCTION-E/P*

*combine the skills/efficiencies of two or more crops such as grain, fiber/oil crops, forages, specialty crops, fruits, and vegetables

36. DIVERSIFIED AGRICULTURE PRODUCTION-E/P*

*combine the skills/efficiencies of at least one crop commodity and at least one livestock commodity

