Title 7: Education K-12

Part 119: Agriculture Food and Natural Resources (REPEAL 11/2013)

2007 Mississippi Curriculum Framework

Secondary Food Products (Meats)

(Program CIP: 01.0401 – Agricultural and Food Products Processing)

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Standards in this document are based on information from the following organizations:

Agriculture, Food, and Natural Resources Standards	Adapted from the publication, <i>Career Cluster Resources for</i> <i>Agriculture, Food, and Natural Resources</i> , National Association of State Directors of Career and Technical Education
Academic Standards	Mississippi Department of Education Subject Area Testing Program
21 st Century Skills	Reproduced with permission of the Partnership for 21 st Century Skills. Further information may be found at www.21stcenturyskills.org

Preface

Secondary Food Products (Meats) Research Synopsis

Articles, books, Web sites, and other materials listed at the end of each unit were considered during the revision process. The textbooks *Principles of Meat Science* and *The Meat We Eat;* journals and magazines such as *The National Provisioner* and *The Packaging Digest;* and organizations including The American Meat Institute, National FFA, and the U.S. Department of Labor were especially useful in providing insight into trends and issues in the field. These references are suggested for use by instructors and students during the study of the topics outlined.

Industry advisory team members from schools throughout the state were asked to give input related to changes to be made to the curriculum framework. Specific comments related to soft skills needed in this program included a strong work ethic, manners, respect, responsibility, communication skills, good attitude, and punctuality. Occupation-specific skills stated included performing calculations, knowledge of cuts, figuring mark-up and profit margin, computer skills, and charting. Safety practices emphasized included equipment safety and sanitation.

Instructors from schools throughout the state were also asked to give input on changes to be made to the curriculum framework. Changes suggested for the curriculum included addition of goat processing, wild game processing, and verification of animal health prior to slaughter. In addition, due to the lack of slaughter facilities in some schools, a reduction in the number of hours spent covering slaughter was requested.

Curriculum

The following state/national standards were referenced in each course of the curriculum.

- Mississippi Department of Education Subject Area Testing Program Academic Standards
 21st Century Skills
- *Career Cluster Resources for Agriculture, Food, and Natural Resources* as published by the National Association of State Directors of Career and Technical Education

Industry and instructor comments, along with current research, were considered by the curriculum revision team during the revision process; and changes were made as needed and appropriate. Many of the skills and topics noted in the research were already included in the curriculum framework. Specific changes made to the curriculum at the March, 2006, curriculum revision meeting included:

- Competencies and objectives were reviewed to ensure accuracy and appropriateness.
- The number of hours suggested for units related to custom slaughter and fabrication of lamb was reduced.
- The verbs used for the competencies related to custom slaughter were changed to accommodate schools without slaughter facilities.
- Goat fabrication was added to the lamb fabrication unit.
- •____The units on poultry and fish fabrication were combined.
- <u>A unit on fabrication of wild game was added.</u>
- Information related to waste management was added.

• The Recommended Tools and Equipment list was updated, and the number of freezer racks and freezer trucks was increased.

Assessment

Students will be assessed using the Secondary Food Products (Meats) MS-CPAS2 Test.

Professional Learning

It is suggested that instructors participate in professional learning related to the following concepts:

- -How to use the Mississippi Agriculture Education BRIDGE site on Blackboard®
- Differentiated instruction To learn more about differentiated instruction, please go to <u>http://www.paee.org/teacher2teacher/additional_subjects.html</u> and click on Differentiated Instruction. Work through this online course and review the additional resources.

Foreword

Secondary vocational technical education programs in Mississippi are faced with many challenges resulting from sweeping educational reforms at the national and state levels. Schools and teachers are increasingly being held accountable for providing true learning activities to every student in the classroom. This accountability is measured through increased requirements for mastery and attainment of competency as documented through both formative and summative assessments.

The courses in this document reflect the statutory requirements as found in Section 37-3-49, Mississippi Code of 1972, as amended (Section 37-3-46). In addition, this curriculum reflects guidelines imposed by federal and state mandates (Laws, 1988, ch. 487, §14; Laws, 1991, ch. 423, §1; Laws, 1992, ch. 519, §4 eff. from and after July 1, 1992; Carl D. Perkins Vocational Education Act III, 1998; and No Child Left Behind Act of 2001).

Each secondary vocational technical course consists of a series of instructional units which focus on a common theme. All units have been written using a common format which includes the following components:

- <u>Unit Number and Title</u>
- <u>Suggested Time on Task</u> An estimated number of clock hours of instruction that should be required to teach the competencies and objectives of the unit. A minimum of 140 hours of instruction is required for each Carnegie unit credit. The curriculum framework should account for approximately 75-80 percent of the time in the course.
- <u>Competencies and Suggested Objectives</u>
 - A competency represents a general concept or performance that students are expected to master as a requirement for satisfactorily completing a unit. Students will be expected to receive instruction on all competencies.
 - The suggested objectives represent the enabling and supporting knowledge and performances that will indicate mastery of the competency at the course level.
- <u>Suggested Teaching Strategies</u> This section of each unit indicates strategies that can be used to enable students to master each competency. Emphasis has been placed on strategies which reflect active learning methodologies. Teachers should feel free to modify or enhance these suggestions based on needs of their students and resources available in order to provide optimum learning experiences for their students.
- <u>Suggested Assessment Strategies</u> This section indicates strategies that can be used to measure student mastery. Examples of suggested strategies could include rubrics, class participation, reflection, and journaling. Again, teachers should feel free to modify or enhance these suggested assessment strategies based on local needs and resources.

- Integrated Academic Topics, Workplace Skills, Technology Standards, and Occupational Standards This section identifies related academic topics as required in the Subject Area Assessment Program (SATP) in Algebra I, Biology I, English II, and U. S. History from 1877, which are integrated into the content of the unit. It also identifies the 21st Century Skills, which were developed by the Partnership for 21st Century Skills, a group of business and education organizations concerned about the gap between the knowledge and skills learned in school and those needed in communities and the workplace. A portion of the 21st Century Skills addresses learning skills needed in the 21st century, including information and communication skills, thinking and problem solving skills, and interpersonal and self-directional skills. The need for these types of skills has been recognized for some time and the 21st Century Skills are adapted in part from the 1991 report from the U.S. Secretary of Labor's Commission on Achieving Necessary Skills (SCANS). Another important aspect of learning and working in the 21st century involves technology skills, and the International Society for Technology in Education, developers of the National Educational Technology Standards (NETS), were strategic partners in the Partnership for 21st Century Skills.
- <u>References</u> A list of suggested references is provided for each unit. The list includes some of the primary instructional resources that may be used to teach the competencies and suggested objectives. Again, these resources are suggested and the list may be modified or enhanced based on needs and abilities of students and on available resources.

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Program Description

The Food Products (Meats) program is designed to prepare the student for entry level employment in the various related phases of processing, marketing, and merchandising of meats. Students are exposed to career and leadership opportunities within their field of study. Students are given an opportunity to master the skills necessary for success in meat processing which may include slaughtering, chilling, aging, quartering, cutting, and inspecting pork, beef, lamb, poultry, goat, wild game, and fish.

Industry standards referenced are from the Agriculture, Food, and Natural Resources Standards.

Course Outline

Food Products (Meats) I

Course CIP Code: 01.0401

Course Description: Food Products (Meats) I is an instructional program that orients an individual to the field of meat processing, marketing, and merchandising. This course allows an individual to prepare for employment or continued education in the meat cutting, packing, and processing professions. Topics include careers, leadership, and orientation; safety, sanitation, equipment, and facility maintenance; livestock slaughter procedures; and pricing, wrapping, and marketing meats. (2 - 21/2 Carnegie units, depending upon time spent in the course)

Unit	Title	Hours
1	Careers and Leadership	15.0
2	Orientation to Meat Processing	
3	Safety, Sanitation, Equipment, and Facility Maintenance	75.0
4	Custom Livestock Slaughter	40.0
5	Pricing, Wrapping, and Marketing	22.5
6	Special Topics in Food Products (Meats) I	32.5

Food Products (Meats) II

Course CIP Code: 01.0490

Course Description: Food Products (Meats) II is a continuation of Food Products (Meats) I. This course allows an individual to prepare for employment or continued education in the meat cutting, packing, and processing professions. Topics include meat cutting; automated processing; quality and yield grading; and curing, smoking, and sausage making. (2 - 21/2 Carnegie units, depending upon time spent in the course)

Unit	Title	Hours
1	Identification and Fabrication of Carcass and Box Beef	60.0
2	Identification and Fabrication of Carcass and Box Pork	37.5
3	Identification and Fabrication of Carcass Lamb and Goat	
4	Identification and Fabrication of Poultry and Fish	7.5
5	Identification and Fabrication of Wild Game	20.0
6	Automated Processing of Meats	7.5
7	Quality and Yield Grading	18.0
8	Curing, Smoking, and Sausage Making	18.0
9	Special Topics in Food Products (Meats) II	18.0

Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Explain career opportunities in meat	Teaching:
cutting, packing, and processing	 Introduce career opportunities in meat
professions.	cutting, packing, and processing
a. Define meat cutter.	professions; discuss job requirements (e.g.,
b. Research the major categories of job	certifications and education) and
classifications in the meat cutting,	occupation-specific and soft skills needed.
packing, and processing profession.	Lead students in a discussion about what
	they know about the field, the types of jobs
	available, and the salaries of those jobs.
	• Outline the units of the program and how
	they relate to various jobs in the field.
	• Use a multiple learning styles inventory to
	determine students' learning styles and
	interests. Share with the students their
	styles and the impact they have.
	Throughout the year, provide varied
	projects to meet the learning styles.
	• Work with the Special Populations
	instructor to assess the reading, writing,
	and math skills of each student and to
	provide materials that are appropriate for
	each student. Plan to reassess students at
	the end of the year.
	• Divide students into groups based on
	learning styles, and have them use the
	Internet or textbooks to research the major
	categories of job classifications in the meat
	ruting, packing, and processing
	professions in the 0.5. and in different
	students present their findings by
	developing a dictionary writing and
	conducting a mock training session for
	pow amployees or making a video or tape
	recording.
	Assessment:
	Monitor student participation in
	discussions using the Group Participation
	Assessment Rubric located in Annendix D
	Evaluate each group's project and
	presentation for content, clarity, and
	length.

2. Ex	plain the leadership opportunities and	Teaching:
act	tivities which are beneficial to students	 Discuss the leadership opportunities and
in	meat cutting, packing, and processing.	activities which are beneficial to students
a.	Identify and describe leadership	in meat cutting, packing, and processing.
	opportunities available from student	 Show a video about, invite a resource
	youth organizations in the school and	person to discuss, or have students use the
	community, including FFA and 4-H.	Internet to research leadership
b.	Describe activities available to	opportunities in FFA and 4-H.
	students in meat cutting, packing, and	 Have each student write an essay
	processing programs including	describing activities available to them.
	leadership development,	 Prepare a meats team for competition in
	competitions, club meetings, fund	FFA and 4-H through job-related and
	raisers, field trips, elected office	leadership development activities.
	leadership positions, and service	 To provide closure to each unit throughout
	projects.	the year, have students summarize what
		they have learned about the topic covered
		and place the summaries in a notebook.
		Review the notebooks at the end of each
		unit and reteach as appropriate to ensure
		mastery.
		Assessment:
		 Monitor student participation in activities.
		 Evaluate essay using the Written Report
		Assessment Rubric located in Appendix D.
		Review summary of unit for understanding
		of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

The following standards were adapted from the publication, *Career Cluster Resources for Agriculture, Food, and Natural Resources.* The complete text of this document can be found at <u>http://www.careerclusters.org/ClusterDocuments/agdocuments/AGFinal.pdf</u>.

- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.

Academic Standards

- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H1 Explain how geography, economics, and politics have influenced the historical development of the United States in the global community.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.
- H3 Describe the relationship of people, places, and environments through time.
- H4 Demonstrate the ability to use social studies tools (e.g., timelines, maps, globes, resources, graphs, a compass, technology, etc.).
- H5 Analyze the contributions of Americans to the ongoing democratic process to include civic responsibilities.

21st-Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

Aberle, E. D., Forrest, J. C., Gerrard, D. E., & Mills, E. W. (2001). *Principles of meat science* (4th-ed.). Dubuque, IA: Kendall/Hunt.

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Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Explain trends in slaughtering and	Teaching:
processing in the past and in the future.	 Discuss trends in slaughtering and
a. Compare trends in slaughtering and	processing during the last 20 years and in
processing in the past 20 years and in	the future.
the future.	 Have students work in groups based on
b. Discuss emerging technologies	their learning styles and use the Internet
related to slaughtering and meat	and current publications to research issues
processing.	or trends. Have groups present information
	about the issue or trend.
	• Have students use the research to develop
	an idea for a new product, prepare, and
	deliver a presentation according to the
	preferred learning styles in order to sell the
	idea to a company (the class). Students
	may use technology to prepare brochures,
	posters, or handouts to distribute during a
	multimedia presentation; create a
	commercial and act it out; or develop a
	newspaper advertisement.
	 Have the class self-evaluate their own
	work and peer-evaluate their classmates'
	work.
	• Have each student select the one product
	that he or she thinks is most likely to be
	successful in the market and prepare a
	brief report justifying the product chosen
	and explaining the expected impact of the
	product on the field.
	Assessment:
	Monitor group work to ensure that each
	member participates in research, idea
	development, and presentation preparation.
	• Evaluate each group's project for content,
	clarity, presentation, and length.
	• Evaluate each student's report using the
	Written Report Assessment Rubric in
	Appendix D.

2. Describe factors affecting consumer food	Teaching:
spending.	 Have students work in groups to
a. Describe factors affecting consumer	brainstorm factors affecting consumer food
food spending to include income,	spending. Lead the class in a discussion of
geographic area, ethnic group, and	various factors, including supply and
religious group.	demand, reasons for the cost of various
b. Discuss biological health hazards	cuts, and other factors.
affecting consumer spending.	 Have each student research a biological
	health hazard that might affect consumer
	spending and present a report to the class,
	write a letter to the editor, or create a
	bulletin board.
	 Have students develop and conduct a
	survey for the local community to
	determine which ethnic groups consume
	which types of foods and why. Have
	students summarize results.
	 Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	• Assess project for content and appearance.
	• Evaluate survey and summary for content.
	• Review summary of unit for understanding
	of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

The following standards were adapted from the publication, *Career Cluster Resources for Agriculture, Food, and Natural Resources.* The complete text of this document can be found at http://www.careerclusters.org/ClusterDocuments/agdocuments/AGFinal.pdf.

- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.

- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- ABS5 Utilize technology to accomplish AFNR business objectives.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H1 Explain how geography, economics, and politics have influenced the historical development of the United States in the global community.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.
- H3 Describe the relationship of people, places, and environments through time.
- H4 Demonstrate the ability to use social studies tools (e.g., timelines, maps, globes, resources, graphs, a compass, technology, etc.).

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

- Aberle, E. D., Forrest, J. C., Gerrard, D. E., & Mills, E. W. (2001). *Principles of meat science* (4th-ed.). Dubuque, IA: Kendall/Hunt.
- Oklahoma Department of Vocational and Technical Education. (1992). *Meat and poultry* processing. Stillwater, OK: Curriculum Instructional Materials Center.
- Romans, J. R., Costello, W. J., Carlson, C. W., & Greaser, M. L. (2001). *The meat we eat* (14th ed.). Danville, IL: Interstate.

Weiss, E., & Weiss, H. (1991). Catering handbook. New York: John Wiley & Sons.

Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Explain general meat laboratory safety	Teaching:
requirements.	 Show students videos demonstrating
a. List and practice safety rules and	examples of accidents in the workplace or
procedures.	invite a speaker from Farm Bureau to
b. Use meat processing equipment	speak about safety. Pre-assess knowledge
safely.	of safety by having each student write a
	summary of the safety violations present in
	the videos or presentations.
	• Describe key school and program policies
	and safety procedures to the class based on
	industry standards and requirements (may
	use the school handbook and any program-
	specific information). Introduce workplace
	skills (SCANS) and how they will be used
	to relate the classroom work to meet
	industry requirements.
	• Lead the class in developing safety
	policies for the classroom based on
	industry policies to include general safety
	tools, hand tools, power cutting equipment,
	personal attire, and hand washing.
	• Divide students into groups based on
	learning styles, and assign each group a
	guideline for personal and laboratory
	safety or general laboratory conduct. Have
	each group role play, create a multimedia
	presentation or a rap song, or write a story
	to discuss the proper and improper
	procedures related to the guideline.
	Demonstrate how to use meat processing
	equipment safely to include knife
	sharpener, steel and hone, stockinette, dead
	lock and tag, scales and weighing items,
	tenderizing machine, vacuum packer,
	slicing machine, salinometer, squeegee
	equipment, band saw, grinder, mixer, patty
	machine, and heat seal. Ensure that each
	student uses equipment safely.
	Assessment:
	• Evaluate the pre-assessment for accuracy.
	Have students self-evaluate and peer-
	evaluate guideline project.

		 Monitor student use of equipment.
		• Ensure that students pass a safety test and
		demonstration of proper use of equipment
		with 100% accuracy.
2. Discuss sanitation as it ar	oplies to a meat	Teaching:
cutting facility.	· · · · · · · · · · · · · · · · · · ·	 Discuss sanitation as it applies to a meat
a. Describe sanitary ope	trations of a	cutting facility.
meat cutting facility.		Describe a meat cutting facility's
b. Describe state and fee	leral inspection	sanitation rules and procedures. Lead
guidelines as they app	oly to meat	students to discuss sanitary operations of a
processing facilities,	including ways	meat cutting facility to include water,
to avoid fecal contam	ination.	drainage, waste disposal, floor and wall
c. Identify correct tempo	eratures for meat	coverings, and refrigeration.
processing and storag	e and explain	Have students research state and federal
the importance of eac	h.	inspection guidelines as they apply to meat
d. Describe the benefits	of a rail system.	cutting facilities, including avoidance of
e. Select and use proper	aprons,	fecal contamination. Have students write a
disposable gloves, ha	rd hats, eye	paper summarizing state and federal
protection, hair nets, i	rubber boots,	inspection guidelines as they apply to meat
etc.		processing facilities to include the
f. Disinfect aprons and	rubber boots	Wholesome Meat Act of 1967.
after each use.		 Invite a guest speaker from USDA to
		discuss proper temperatures for
		processing, cooking, and storage.
	•	• Have students research and prepare a chart
		identifying correct temperatures for meat
		processing and storage and explain the
		importance of each to include freezer,
		cooler, and cutting room.
	•	Have students research various diseases
		caused by microorganisms and their causes
		and present their findings to the class.
	•	• Demonstrate the safe use of a rail system.
		Lead students in a discussion about the
		benefits of a rail system to include
		handling carcasses and weighing
		carcasses.
	•	Discuss and demonstrate the proper use of
		aprons, disposable gloves, nard nats, eye
		protection, nair nets, rubber boots, etc.
		dispossible gloves hard hete eve
		uisposable gloves, hard hals, eye
		protection, nair fiels, rubber bools, etc.
	•	Discuss and ucinonstrate cleaning and disinfocting aprops and where boots. Howe
		atudant diginfact anrang and muchan basts
		Student distinct aprons and fubber boots

	after each use.
	Assessment:
	 Monitor student participation in
	discussions and activities using the
	Activity Performance Rubric located in
	Appendix D.
	• Evaluate inspection guideline report using
	the Written Report Assessment Rubric
	located in Appendix D.
	 Assess microorganism presentation using
	the Presentation Checklist located in
	Appendix D.
3. Discuss federal regulations relating to	Teaching:
meat processing.	• Invite a guest speaker to discuss federal
a Discuss HACCP (Hazards Analysis	regulations relating to meat processing and
Critical Control Point) as a method to	have each student summarize the main
prevent foodborne illness	points made by the speaker
h Discuss the role of the USDA Food	Discuss how HACCP (Hazards Analysis
Safety and Inspection Service relating	Critical Control Point) can belp prevent
to quality assurance.	foodborne illnesses. Have each student
to quanty assurance.	research and list steps of the HACCP
	system and describe the system's influence
	on food safety programs
	Have students work in groups to research
	•
	Convice's role in conving concurrent quality
	and manage a same video tono on
	and prepare a game, video tape, or
	newspaper article.
	Assessment:
	• Keview student summaries for accuracy.
	• Evaluate HACCP list for correctness.
	• Assess USDA project for content and
	neatness.
4. Identity and use equipment for meat	Teaching:
cutting, packing, and processing.	• Identify and demonstrate the use of
a. Identify equipment used in a meat	equipment for meat cutting, packing, and
laboratory including a band saw,	processing.
grinder, mixer, tenderizer, slicing	• Have students work in groups to prepare a
machine, stuffer, and pickle pump.	mock training session, display, or
b. Assemble and disassemble equipment	electronic presentation identifying the
including band saw, grinder, mixer,	types and uses of various pieces of
tenderizer, slicing machine, stuffer,	equipment.
and pickle pump.	 Have each student identify and
c. Identify, use, and sanitize other meat	demonstrate the proper use of all
cutting equipment including knives,	equipment, including assembly,
knife sharpener, steel and hone,	disassembly, and sterilization.

stockinette, dead lock and tag, scales	Assessment:
and weighing items, vacuum packer,	 Assess group project for content and
salinometer, squeegee equipment,	accuracy.
patty machine, heat seal, cooler,	 Ensure that each student demonstrates the
freezer, rail system, tables,	proper use of all equipment with 100%
immobilizer, hoist, dehairing	accuracy.
machine, skinning knife, and carcass	
split saw.	
d. Use sterilizer for knives and steel.	
5. Demonstrate equipment maintenance	Teaching:
used in a meat cutting facility.	 Demonstrate procedures for equipment
a. Maintain a sharp knife including	maintenance used in a meat cutting
boning and butcher knives.	facility, including sharpening, inspection.
b. Perform equipment and maintenance	maintenance, disinfection, and hand
procedures for grinder, slicer, and	washing.
hand saw.	 Have each student accurately demonstrate
c. Use proper disinfection procedures	all tasks, including sharpening, inspection.
for cleaning tables after use.	maintenance, disinfection, and hand
d Demonstrate proper hand washing	washing
procedure before and after working in	 Discuss and demonstrate proper
the meat cutting laboratory	disinfection procedures for cleaning tables
	after use. Have students work in groups to
	take samples from various areas (e.g.
	tables door knobs and equipment) plate
	the samples on agar plates and analyze the
	arowth of microorganisms. Have each
	student prepare a laboratory report
	Discuss and demonstrate proper hand
	washing procedure to be used before and
	after work in the meat cutting laboratory
	Have students research the work of Joseph
	Lister and write a report on the
	significance of his work on meat
	processing
	A scossmont:
	Assess each student's ability to perform
	tacke
	Access student participation in lab activity
	and evaluate lab report using the Lab
	Inquiry Pubric located in Appendix D
	Review Lister report using the Written
	Peport Assessment Rubric located in
	Appendix D
6 Maintain a safe and sanitary facility	Togehing.
a Wash and disinfect walls and floors	 Describe methods necessary to maintain a
b. Maintain a safe environment by	safe and sanitary facility, including wall

wiping up spills, keeping aisles clear,	and floor sanitation procedures and safety
and performing other tasks.	procedures.
	 Have each student demonstrate how to
	wash and disinfect walls and floors and to
	maintain a safe working environment by
	wiping up spills, keeping aisles clear, and
	performing other tasks.
	• Discuss the pH scale and its relation to
	bacterial growth in the meat processing
	industry. Have each student measure pH
	levels of various solutions, summarize the
	effects on bacterial growth, and complete a
	lab report.
	• Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	 Monitor student participation in activities
	using the Activity Performance Rubric
	located in Appendix D.
	•—Assess lab report using the Lab Inquiry
	Rubric located in Appendix D.
	• Review summary of unit for understanding
	of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

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- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.

- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem-solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- B6 Investigate concepts of natural selection as they relate to diversity of life.
- B7 Investigate the interdependence and interactions that occur within an ecosystem.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy

- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

- Aberle, E. D., Forrest, J. C., Gerrard, D. E., & Mills, E. W. (2001). *Principles of meat science* (4th-ed.). Dubuque, IA: Kendall/Hunt.
- Mississippi Department of Agriculture and Commerce Regulatory Services. (n.d.). Retrieved March 23, 2006, from http://www.mdac.state.ms.us/n_library/departments/reg_services/rgs_meat.html
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- Weiss, E., & Weiss, H. (1991). Catering handbook. New York: John Wiley & Sons.

Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Explain terms and procedures associated	Teaching:
with livestock slaughter.	 Describe various procedures used for
a. Define terms and procedures	livestock slaughter in various parts of the
associated with the slaughter of beef.	world.
b. Define terms and procedures	 Pre-assess student knowledge of terms by
associated with the slaughter of	leading a game requiring students to work
swine.	in teams to match terms and definitions:
c. Define terms and procedures	beef to include immobilization,
associated with the slaughter of lamb	evisceration, skinning, splitting, and
and goat.	weighing; swine to include
d. Define terms and procedures	immobilization, dehairing process or
associated with the slaughter of	skinning, evisceration, splitting, and
poultry.	weighing; lamb and goat to include
e. Define terms and procedures	immobilization, skinning, evisceration,
associated with the slaughter of fish.	splitting, and weighing; poultry to include
f. Define terms and procedures	immobilization, defeathering, evisceration,
associated with dressing of wild	weighing, processing, and grading; and
game.	fish to include immobilization,
g. Discuss the difference between	evisceration, skinning, weighing, and
antemortem and postmortem	processing.
inspection.	 Identify and discuss factors such as illness
	and malnutrition to consider when
	determining whether an animal is fit or
	unfit for slaughter. Have students
	brainstorm symptoms indicating that an
	animal is unfit for slaughter. Have each
	student research a reason that an animal
	would be considered unfit and present the
	information to the class.
	Assessment:
	 Monitor student participation in
	terminology game.
	 Evaluate slaughter presentation using the
	Presentation Checklist located in Appendix
	D.
2. Discuss types, cleaning, use, and	Teaching:
maintenance of slaughter facility and	• Identify and demonstrate how to clean and
equipment.	use equipment in the meat slaughter
a. Identify equipment including	facility. Show a video, invite a guest
immobilizer, skinning knives, rails	speaker, or take students on a field trip to a
and rail hooks, scales, dehairing	slaughter facility. Have each student
machine, hoist, and carcass split saw.	summarize key points learned.

(40 hours)

b. Discuss maintenance of a safe and	 Have students identify, clean, use, and
sanitary facility.	maintain equipment to include
c. Identify what constitutes	immobilizer, skinning knives, rails and rail
contamination from biologic and	hooks, scales, dehairing machine, hoist,
toxic sources.	and carcass split saw.
	• Explain and reinforce proper safety and
	sanitation in the meat slaughter facility.
	 Have students maintain a safe and sanitary
	facility by following proper disinfection
	procedures for facility, equipment, and
	self.
	 Explain how facility, equipment, and meat
	products may be contaminated from
	biologic and toxic sources.
	 Have each student research wavs to
	prevent livestock, equipment, and meat
	products from contamination by biologic
	and toxic sources and prepare a magazine
	article or bulletin board.
	Assessment:
	Review summary for content.
	 Monitor student activity using the Activity
	Performance Rubric located in Appendix
	D.
	 Evaluate contamination product for
	content and appearance.
3. Discuss procedures for slaughtering	Teaching:
livestock and dressing wild game.	 Discuss procedures for slaughtering
a. Discuss procedures for slaughtering a	various livestock and dressing wild game.
beef.	Show a video, invite a guest speaker, or
b. Discuss procedures for slaughtering a	take students on a field trip to a slaughter
swine.	facility. Have each student write a
e. Discuss procedures for slaughtering a	summary of key points.
lamb and goat.	 Show students examples of livestock that
d. Discuss procedures for dressing wild	will have parts condemned. Lead students
game.	to brainstorm when part of a carcass
e. Discuss procedures for slaughtering	should be condemned.
livestock and recognize when to	 Have each student research methods of
condemn part of a carcass.	disposing of offal and write a report.
f. Describe methods of disposing of	• <u>Have each student summarize what he or</u>
offal.	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	 Review slaughter summary for content.

Evaluate offal report using the Written
Report Assessment Rubric located in
Appendix D.
• Review summary of unit for understanding
of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

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- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.
- ANM2 Recognize animal behaviors to facilitate working with animals safely.
- ANM3 Provide proper nutrition to maintain animal performance.

ANM4 Know the factors that influence an animal's reproductive cycle to explain species response.

- ANM5 Identify environmental factors that affect an animal's performance.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- NRS5 Practice responsible conduct to protect natural resources.

ENV2 Identify public policies and regulations impacting environmental services to determine their effect on facility operations.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem-solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

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- Hofer, L. (n.d). *Processing wild game the easy way* [Video]. (Available from Lee's Meats & Sausages, Tea, SD, 1-888-368-6644, <u>www.leesmeats.com</u>)

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- Penner, K. P. (1996). *Care and handling of deer from field to table*. Retrieved March 23, 2006, from <u>http://www.oznet.ksu.edu/library/fntr2/mf2176.pdf</u>
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Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Compare and contrast consumer trends,	Teaching:
supply and demand, and the effects on	 Present a current event item such as the
meat prices.	results of a scientific study or a natural
a. Discuss supply and demand and its	disaster that is related to consumer trends
effects on meat prices.	and supply and demand.
b. Identify current consumer trends.	• Divide students into groups and conduct a
	debate on supply and demand and its
	effects on meat prices to include current
	market price, location, cut of meat, quality
	of meat, and quantity of meat.
	 Have each student research current
	consumer trends to include special diets,
	reduction in fats, and precooked meats and
	prepare a report.
	Assessment:
	 Evaluate student participation in debate.
	• Assess trends report using the Written
	Report Assessment Rubric located in
	Appendix D.
2. List the steps and perform a cutting test.	Teaching:
a. List the steps in a cutting test.	• List the steps and perform a cutting test.
b. Perform a cutting test.	• Have each student list the steps in a cutting
	test and perform a cutting test to include
	weigh wholesale cut, weigh fat and bone,
	weigh each retail cut, price each cut, and
	then compare to original cost.
	Assessment:
	 Monitor student performance of cutting
	test using the Activity Performance Rubric
	located in Appendix D.
3. Discuss techniques and wrap retail meat.	Teaching:
a. Discuss techniques of wrapping retail	 Discuss various techniques for wrapping
meats.	meat to include wrapping and labeling
b. Wrap and label meat for home	meats for home freezing and wrapping,
freezing.	weighing, labeling, and pricing meats for
c. Wrap, weigh, label, and price meat	retail sale.
for retail sale.	Given a situation or case, have students
d. Describe the proper temperatures for	work in groups to choose techniques of
maximum storage life of retail meats	wrapping retail meats to include correct
using a cooler, display case, or	tray size, poultry mat, correct positioning
freezer.	of meat on tray, tight wrap, good seal, and
e. Vacuum seal various cuts of meat.	position of label.

	 Have students work in groups to
	demonstrate how to wrap and label meat
	for home freezing to include tearing off
	desired length of freezer wrapping paper;
	placing desired portion of meat on the
	waxed side of the paper; wrapping airtight
	and taping each package of meat, padding
	sharp bones if necessary; and labeling each
	package according to the cut and other
	customer specifications.
	 Have each student demonstrate how to
	wrap, weigh, label, and price meat for
	retail sale using a commercially available
	system.
	Have each student research the proper
	temperature ranges for maximum storage
	life of retail meats using a cooler, display
	case, or freezer and prepare a report.
	Assessment:
	 Assess retail meet case study using the
	Case Study Assessment Rubric located in
	Appendix D.
	 Monitor student wrapping using the
	Activity Performance Rubric located in
	Appendix D.
	 Evaluate temperature report for content.
4. Describe marketing principles related to	Teaching:
the display of meat.	• Discuss marketing principles related to the
a. Describe marketing principles related	display of meat including principles of
to the display of meat.	mark-up and the position of retail cuts in
b. Describe the effects vacuum sealing	meat counter, meat rotation, shelf life, and
has on shelf life of meat.	effects of vacuum sealing on shelf life.
	 Have students work in groups to develop
	marketing plans for a given cut based on
	sample invoices and to develop a grocery
	store ad, commercial, or sales pitch. Have
	students present their information to the
	class for peer-review.
	• Have students develop a marketing scheme
	to draw students into the Food Products
	program and present their information to
	other students during their classes.
	Discuss marketing principles as related to
	displaying meats in a retail setting. Order
	materials from agencies such as the
	American Pork Board, American and

Mississippi Cattleman's Associations, and
other groups, and have students work in
groups to develop display cases using
materials. Have other teachers or industry
personnel judge the displays; award a prize
to the winning display(s).
• Have each student summarize what he or
she learned about the unit and place the
summary in his or her notebook. Review
the notebooks and reteach as appropriate to
ensure mastery.
Assessment:
Evaluate marketing plan and scheme for
content and appearance.
 Monitor student participation in display
activity.
• Review summary of unit for understanding
of material and reteach as needed.

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- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- TEC2 Use available power sources to plan and apply control systems.
- TEC3 Explain geospatial technology to demonstrate its applications.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS2 Practice good record keeping to accomplish AFNR business objectives.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
- ABS5 Utilize technology to accomplish AFNR business objectives.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A2 Recognize, create, extend, and apply patterns, relations, and functions and their applications.
- A5 Utilize various formulas in problem solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H1 Explain how geography, economics, and politics have influenced the historical development of the United States in the global community.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.
- H3 Describe the relationship of people, places, and environments through time.

H4 Demonstrate the ability to use social studies tools (e.g., timelines, maps, globes, resources, graphs, a compass, technology, etc.).

21st Century Skills

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Food Products (Meats) I Unit 6: Special Topics in Food Products (Meats) I (Ongoing)

(32.5 hours)

(NOTE: Competencies and suggested objectives in this unit should be integrated into other instructional units throughout the year. This unit is designated as ongoing and is repeated in both years of the program; however, students should be expected to continually observe and report on current topics.)

Competencies and Suggested Objectives	Suggested Strategies for Competencies	
1. Investigate new and emerging	Teaching:	
technologies, practices, trends, and issues	 Have each student conduct research and 	
associated with Food Products (Meats).	prepare a report on a new or emerging	
a. Prepare a report on a new and	technology, trend, or issue associated with	
emerging technology associated with	Food Products (Meats).	
Food Products (Meats).	Assessment:	
b. Prepare a report on a current trend or	 Evaluate report using the Written Report 	
issue associated with Food Products	Assessment Rubric located in Appendix D.	
(Meats).		
2. Complete school to careers activities	Teaching:	
related to Food Products (Meats).	• Have each student participate in a school-	
a. Participate in a school-to-careers	to-careers activity such as a shadowing or	
activity (shadowing, mentoring,	mentoring experience, or a career fair.	
career fair, etc.) related to Food	 Have students work in groups to 	
Products (Meats).	investigate postsecondary educational	
b. Investigate educational opportunities	opportunities at the community/junior	
related to Food Products (Meats) at	college, four-year college, and	
the postsecondary level.	apprenticeship level and prepare a chart,	
c. Describe national standards and	electronic presentation, or booklet.	
certification/licensing procedures	 Have students work in groups to 	
related to Food Products (Meats).	investigate any national standards that	
d. Describe the role of trade	apply to Food Products (Meats) and	
organizations, associations, and	prepare a written report on national or	
unions as related to Food Products	regional certification or licensure programs	
(Meats)	or agencies.	
	 Have each student identify trade 	
	associations, professional organizations,	
	and unions associated with Food Products	
	(Meats) and describe how their role affects	
	employees in an oral presentation.	
	Assessment:	
	• Monitor student participation in school-to-	
	careers activity.	
	Evaluate educational opportunities product	
	for content and appearance.	
	 Assess certification/licensure report using 	
	the Written Report Checklist located in	
		Appendix D.
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		 Evaluate organization presentation using
		the Presentation Checklist located in
		Appendix D.
3. Demonstrate related	l academic skills and	Teaching:
workplace skills ass	ociated with Food	Have students work in groups to complete
Products (Meats).		a cooperative project such as a paper.
a. Complete a coor	perative project	presentation. or demonstration associated
(paper, presenta	tion, or	with a related academic subject.
demonstration)	associated with an	• Lead students to practice human relations
academic subject	et and Food Products	skills such as team participation,
(Meats).		client/customer service, and negotiation
b. Practice human	relations skills (team	throughout the year in Food Products
participation, cli	ient/customer service,	(Meats).
leadership, nego	stiation, working with	Have students research acceptable work
culturally divers	se groups, etc.) related	ethics and determine employer
to Food Product	s (Meats).	expectations for persons employed in Food
c. Research work of	ethics and employer	Products (Meats) by interviewing
expectations of	employees in Food	employers, supervisors, and employees
Products (Meats	;).	and reporting back to the class.
		Assessment:
		 Evaluate cooperative project for content.
		• Monitor practice of human relations skills.
		• Assess report on work ethics and employer
		expectations for content and presentation.
4. Investigate the conc	epts of quality	Teaching:
assurance as related	to Food Products	 Lead a discussion of the concepts of
(Meats).		quality assurance and the methods that can
a. Describe quality	concepts and	be used to measure quality and gauge
methods for mea	asuring quality related	quality improvement as related to Food
to Food Product	is (Meats).	Products (Meats).
b. Apply quality co	oncepts in the Food	 Have students apply quality concepts in
Products (Meats	s) laboratory.	the Food Products (Meats) by measuring
		the quality of their work and charting the
		increase in quality over time.
		Assessment:
		• Evaluate student assignment to chart
		quality increase over time in school
		laboratory or work experience for content
		and appearance.
5. Examine trends and	changes related to	Teaching:
Food Products (Mea	ats) and global	• Lead a discussion of the different concepts
economic factors.		ot global economics and competition as
a. Define and disci	uss the concept of	related to Food Products (Meats).
global economic	es and competition.	• Lead a discussion, using current
b. Describe global	economic factors and	newspaper and magazine articles, on

competition as related to Food	specific issues related to Food Products
Products (Meats).	(Meats) and global economics and
c. Identify regions and other countries	competition. Identify other countries
which compete in Food Products	which compete with products made in the
(Meats).	United States.
	• Have students determine other regions and
	countries that affect competition in Food
	Products (Meats) and describe in an oral
	presentation ways in which this
	competition affects workers.
	 Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	 Monitor student participation in
	discussions.
	 Evaluate competition report for content
	and presentation.
	• Review summary of unit for understanding
	of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

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- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.

ANM2 Recognize animal behaviors to facilitate working with animals safely.

- ANM3 Provide proper nutrition to maintain animal performance.
- ANM4 Know the factors that influence an animal's reproductive cycle to explain species response.
- ANM5 Identify environmental factors that affect an animal's performance.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- NRS4 Employ knowledge of natural resource industries to describe production practices and processing procedures.
- NRS5 Practice responsible conduct to protect natural resources.
- ENV2 Identify public policies and regulations impacting environmental services to determine their effect on facility operations.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS2 Practice good record keeping to accomplish AFNR business objectives.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
- ABS5 Utilize technology to accomplish AFNR business objectives.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- B5 Investigate the principles, mechanisms, and methodology of classical and molecular genetics.
- B6 Investigate concepts of natural selection as they relate to diversity of life.
- B7 Investigate the interdependence and interactions that occur within an ecosystem.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.

- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H1 Explain how geography, economics, and politics have influenced the historical development of the United States in the global community.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.
- H3 Describe the relationship of people, places, and environments through time.
- H4 Demonstrate the ability to use social studies tools (e.g., timelines, maps, globes, resources, graphs, a compass, technology, etc.).
- H5 Analyze the contributions of Americans to the ongoing democratic process to include civic responsibilities.

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

Meat and Poultry. (n.d.). Retrieved March 23, 2006, from http://www.meatpoultry.com/

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The National Provisioner. (n.d.). Retrieved March 23, 2006, from <u>http://www.nationalprovisioner.com/</u>

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Food Products (Meats) II Unit 1: Identification and Fabrication of Carcass and Box Beef

<u>(60 hours)</u>

Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Identify and fabricate cuts of beef.	Teaching:
a. Identify carcass break cuts of beef.	 Show students grocery store ads and have
b. Make retail cuts of round.	them identify various cuts.
c. Make retail cuts of loin.	 Show students videos demonstrating
d. Make retail cuts of rib.	procedures for making various cuts, and
e. Make retail cuts of chuck.	discuss steps involved.
f. Make retail cuts of foreshank.	 Have students identify carcass break cuts
g. Make retail cuts of brisket.	of beef to include round, loin, beef, chuck,
h. Make retail cuts of plate.	foreshank, brisket, plate, and flank.
i. Make retail cuts of flank.	 Have students make retail cuts of round to
	include top round, bottom round, eye
	o'round, heel o'round, round steak, tip
	roast, and rump roast.
	 Have students make retail cuts of loin to
	include sirloin steak, porterhouse steak, t-
	bone steak, club steak, top loin steak, and
	tenderloin steak.
	 Have students make retail cuts of rib to
	include ribeye steak, ribeye roast, prime
	rib roast, rib steak, and bone-in rib roast.
	 Have students make retail cuts of chuck to
	include chuck eye roast and steak, blade
	chuck roast and steak, 7-bone chuck roast
	and steak, top blade chuck roast and steak,
	under blade chuck roast and steak, and arm
	roast and steak.
	 Have students make retail cuts of
	foreshank to include shank cross cuts, soup
	bone, and ground beef.
	• Have students make retail cuts of brisket to
	include bone-in brisket, boneless brisket,
	and ground beef.
	• Have students make retail cuts of plate to
	include stew meat, short ribs, and ground
	beef.
	• Have students make retail cuts of flank to
	include flank steak and ground beef.
	• Have students keep a journal of questions
	that arise as they work.
	Assessment:
	• <u>Pre-assess student knowledge of cuts.</u>
	 Monitor student work using the Activity

	Performance Rubric located in Appendix
	D.
2. Identify and fabricate variety cuts of	Teaching:
beef.	 Show students videos demonstrating
a. Make retail cuts of tongue.	procedures for making various cuts, and
b. Make retail cuts of heart.	discuss steps involved.
c. Make retail cuts of liver.	 Have students make retail cuts of tongue.
d. Make retail cuts of kidney.	 Have students make retail cuts of heart.
e. Make retail cuts of brain.	 Have students make retail cuts of liver.
	 Have students make retail cuts of kidney.
	 Have students make retail cuts of brain.
	 Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	 Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
	• Review summary of unit for understanding
	of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

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- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.

ANM3 Provide proper nutrition to maintain animal performance.

ANM5 Identify environmental factors that affect an animal's performance.

- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- NRS4 Employ knowledge of natural resource industries to describe production practices and processing procedures.
- NRS5 Practice responsible conduct to protect natural resources.
- ENV2 Identify public policies and regulations impacting environmental services to determine their effect on facility operations.
- ENV3 Apply scientific principles to environmental services.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS2 Practice good record keeping to accomplish AFNR business objectives.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
- ABS5 Utilize technology to accomplish AFNR business objectives.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.

- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

- Aberle, E. D., Forrest, J. C., Gerrard, D. E., & Mills, E. W. (2001). *Principles of meat science* (4th-ed.). Dubuque, IA: Kendall/Hunt.
- Davis, G. W. (n.d.). Beef retail cut ID [Video]. Lubbock, TX: Creative Education Video.
- Oklahoma Department of Vocational and Technical Education. (1992). *Meat and poultry* processing. Stillwater, OK: Curriculum Instructional Materials Center.
- Romans, J. R., Costello, W. J., Carlson, C. W., & Greaser, M. L. (2001). *The meat we eat* (14th ed.). Danville, IL: Interstate.
- Weiss, E., & Weiss, H. (1991). Catering handbook. New York: John Wiley & Sons.

Food Products (Meats) II Unit 2: Identification and Fabrication of Carcass and Box Pork

Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Identify and fabricate cuts of pork.	Teaching:
a. Identify carcass break cuts of pork.	Show students grocery store ads and have
b. Make retail cuts of ham.	them identify various cuts.
c. Make retail cuts of loin.	Show students videos demonstrating
d. Make retail cuts of shoulder (Boston	procedures for making various cuts, and
butt and picnic).	discuss steps involved.
e. Make retail cuts of side.	 Have students identify carcass break cuts
	of pork to include ham, loin, shoulder, and side
	Have students make retail cuts of ham to
	include shark half butt half center slice
	whole ham, and hocks.
	 Have students make retail cuts of loin to
	include sirloin chops, blade chops, rib
	chops, center cut chops, loin eye roast,
	butterfly chops, and bone-in roast.
	• Have students make retail cuts of shoulder
	to include Boston butt and picnic, blade
	steak, boneless shoulder roast, and grind
	for sausage.
	• Have students make retail cuts of side to
	include salt pork, spare ribs, and slab
	bacon.
	• Have students keep a journal of questions
	that arise as they work.
	Assessment:
	 Pre-assess student knowledge of cuts.
	 Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
2. Identify and fabricate retail variety cuts	Teaching:
of pork.	Show students videos demonstrating
a. Make retail cuts of tongue.	procedures for making various cuts, and
b. Make retail cuts of liver.	discuss steps involved.
c. Make retail cuts of chitterlings.	• Have students make retail cuts of tongue.
d. Make retail cuts of stomach.	Have students make retail cuts of
e. Make retail cuts of kidneys.	chitterlings.
t. Make retail cuts of snouts.	• Have students make retail cuts of stomach.
	• Have students make retail cuts of kidneys.
	Have students make retail cuts of snouts.
	• Have each student summarize what he or
	she learned about the unit and place the

summary in his or her notebook. Review
the notebooks and reteach as appropriate to
ensure mastery.
Assessment:
 Monitor student work using the Activity
Performance Rubric located in Appendix
D.
• Review summary of unit for understanding
of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

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- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.

ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.

- ANM3 Provide proper nutrition to maintain animal performance.
- ANM5 Identify environmental factors that affect an animal's performance.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.

- NRS4 Employ knowledge of natural resource industries to describe production practices and processing procedures.
- NRS5 Practice responsible conduct to protect natural resources.
- ENV2 Identify public policies and regulations impacting environmental services to determine their effect on facility operations.
- ENV3 Apply scientific principles to environmental services.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS2 Practice good record keeping to accomplish AFNR business objectives.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
- ABS5 Utilize technology to accomplish AFNR business objectives.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem-solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.

21st-Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills

CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

- Aberle, E. D., Forrest, J. C., Gerrard, D. E., & Mills, E. W. (2001). *Principles of meat science* (4th-ed.). Dubuque, IA: Kendall/Hunt.
- Davis, G. W. (n.d.). Pork retail cut ID [Video]. Lubbock, TX: Creative Education Video.
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- Romans, J. R., Costello, W. J., Carlson, C. W., & Greaser, M. L. (2001). *The meat we eat* (14th ed.). Danville, IL: Interstate.

Weiss, E., & Weiss, H. (1991). Catering handbook. New York: John Wiley & Sons.

Food Products (Meats) II Unit 3: Identification and Fabrication of Carcass Lamb and Goat (15 hours)

Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Identify and fabricate cuts of lamb and	Teaching:
goat.	 Show students grocery store ads and have
a. Identify carcass break cuts of lamb	them identify various cuts.
and goat.	 Show students videos demonstrating
b. Identify retail cuts of leg.	procedures for making various cuts, and
c. Identify retail cuts of loin.	discuss steps involved.
d. Identify retail cuts of rib.	 Have students identify carcass break cuts
e. Identify retail cuts of shoulder.	of lamb to include leg, loin, rib, shoulder,
f. Identify retail cuts of foreshank and	foreshank, and breast.
breast.	Have students make retail cuts of leg to
	include whole leg, center cut leg roast,
	French style roast, center slice, hind shank,
	and boneless leg roast.
	• Have students make retail cuts of loin to
	include loin chop and double loin chop.
	 Have students make retail cuts of rib to
	include rib chop, French style rib chop, rib
	roast, and crown roast.
	• Have students make retail cuts of shoulder
	to include square cut shoulder, boneless
	shoulder roast, blade chop, arm chop, and
	neck slice.
	 Have students make retail cuts of
	foreshank and breast to include shank,
	spareribs, boneless rolled breast, and
	riblets.
	•—Have students keep a journal of questions
	that arise as they work.
	Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	• <u>Pre-assess student knowledge of cuts.</u>
	Monitor student work using the Activity
	Performance Kubric located in Appendix
	• Keview summary of unit for understanding
	of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

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- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.
- ANM3 Provide proper nutrition to maintain animal performance.
- ANM5 Identify environmental factors that affect an animal's performance.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- NRS4 Employ knowledge of natural resource industries to describe production practices and processing procedures.
- NRS5 Practice responsible conduct to protect natural resources.
- ENV2 Identify public policies and regulations impacting environmental services to determine their effect on facility operations.
- ENV3 Apply scientific principles to environmental services.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS2 Practice good record keeping to accomplish AFNR business objectives.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
- ABS5 Utilize technology to accomplish AFNR business objectives.

ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

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- Oklahoma Department of Vocational and Technical Education. (1992). *Meat and poultry* processing. Stillwater, OK: Curriculum Instructional Materials Center.

Romans, J. R., Costello, W. J., Carlson, C. W., & Greaser, M. L. (2001). *The meat we eat* (14th ed.). Danville, IL: Interstate.

Weiss, E., & Weiss, H. (1991). Catering handbook. New York: John Wiley & Sons.

Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Identify and fabricate cuts of poultry.	Teaching:
a. Identify carcass break cuts of poultry.	 Take students on a field trip to a local
b. Make retail cuts of breast quarter.	poultry processor.
c. Make retail cuts of leg quarter.	 Have students work in groups to research
d. Make retail cuts of back quarter.	the importance of poultry in Mississippi
	and prepare a report.
	 Show students videos demonstrating
	procedures for making various cuts, and
	discuss steps involved.
	• Have students identify carcass break cuts
	of poultry to include breast quarter, leg
	quarter, and back quarter.
	Have students make retail cuts of breast
	quarter to include breast and wing,
	dreamboat, and boneless breast.
	Have students make retail cuts of leg
	quarter to include thigh and leg.
	Have students make retail cuts of back
	quarter to include back.
	• Have students keep a journal of questions
	that arise as they work.
	Assessment:
	 Monitor student participation in field trip
	using the Field Trip Participation Checklist
	located in Appendix D.
	•—Assess poultry report using the Written
	Report Checklist located in Appendix D.
	Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
2. Identify variety cuts of poultry.	Teaching:
a. Identify retail cuts of heart.	 Show students videos demonstrating
b. Identify retail cuts of liver.	procedures for making various cuts, and
c. Identify retail cuts of gizzard.	discuss steps involved.
d. Identify retail cuts of neck.	• Have students make retail cut of heart.
	 Have students make retail cut of liver.
	• Have students make retail cut of gizzard.
	 Have students make retail cut of neck.
	Assessment:
	 Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.

3. Identify retail cuts of fish.	Teaching:
	 Have students work in groups to research
	the importance of catfish in Mississippi
	and prepare a bulletin board or other
	display.
	 Demonstrate procedures for making retail
	cuts of fish.
	• Have students identify and make retail cuts
	of fish to include whole fish or fillet fish.
	 Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	 Review catfish project for content and
	appearance.
	 Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
	• Review summary of unit for understanding
	of material and reteach as needed.

Agriculture, Food, and Natural Resources Standards

The following standards were adapted from the publication, *Career Cluster Resources for Agriculture, Food, and Natural Resources.* The complete text of this document can be found at http://www.careerclusters.org/ClusterDocuments/agdocuments/AGFinal.pdf.

- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.

ANM3 Provide proper nutrition to maintain animal performance.

ANM5 Identify environmental factors that affect an animal's performance.

- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- NRS4 Employ knowledge of natural resource industries to describe production practices and processing procedures.
- NRS5 Practice responsible conduct to protect natural resources.
- ENV2 Identify public policies and regulations impacting environmental services to determine their effect on facility operations.
- ENV3 Apply scientific principles to environmental services.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS2 Practice good record keeping to accomplish AFNR business objectives.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
- ABS5 Utilize technology to accomplish AFNR business objectives.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.

- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

- Aberle, E. D., Forrest, J. C., Gerrard, D. E., & Mills, E. W. (2001). *Principles of meat science* (4th-ed.). Dubuque, IA: Kendall/Hunt.
- Oklahoma Department of Vocational and Technical Education. (1992). *Meat and poultry* processing. Stillwater, OK: Curriculum Instructional Materials Center.
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Weiss, E., & Weiss, H. (1991). Catering handbook. New York: John Wiley & Sons.

Food Products (Meats) II Unit 5: Identification and Fabrication of Wild Game

Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Identify and fabricate cuts of wild game.	Teaching:
a. Make cuts of top round.	 Have students work in groups to research
b. Make cuts of bottom round.	the importance of wild game in Mississippi
c. Make cuts of tip roast.	and prepare a bulletin board or other
d. Make cuts of eye round.	display.
e. Make cuts of loin eye.	Demonstrate procedures for making cuts
f. Make cuts of ribs.	of wild game.
f. Debone front shoulders.	 Have students identify and make cuts of
	wild game including top round, bottom
	round, tip roast, eye round, loin eye, and
	ribs. Have students debone front shoulders.
	Assessment:
	• Review wild game project for content and
	appearance.
	 Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
2. Prepare wild game specialty products.	Teaching:
a. Prepare various sausage products.	Demonstrate procedures for making wild
b. Prepare ground products.	game specialty products.
c. Prepare jerky products.	Have students identify and make wild
	game specialty products including sausage,
	ground products, and jerky.
	• Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
	Review summary of unit for understanding
	of material and reteach as needed.

STANDARDS

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- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.
- ANM3 Provide proper nutrition to maintain animal performance.
- ANM5 Identify environmental factors that affect an animal's performance.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
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- ABS5 Utilize technology to accomplish AFNR business objectives.
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- A5 Utilize various formulas in problem solving situations.
- A8 Analyze data and apply concepts of probability.

- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem Solving Skills
- CS6 Interpersonal and Self-Directional Skills

SUGGESTED REFERENCES

- Aberle, E. D., Forrest, J. C., Gerrard, D. E., & Mills, E. W. (2001). *Principles of meat science* (4th-ed.). Dubuque, IA: Kendall/Hunt.
- Hofer, L. (n.d). *Processing wild game the easy way* [Video]. (Available from Lee's Meats & Sausages, Tea, SD, 1-888-368-6644, <u>www.leesmeats.com</u>)
- Ohio Department of Natural Resources Division of Wildlife. (2005). Field dressing deer. Retrieved March 23, 2006, from http://www.dnr.ohio.gov/wildlife/Hunting/deer/fielddress.htm
- Oklahoma Department of Vocational and Technical Education. (1992). *Meat and poultry* processing. Stillwater, OK: Curriculum Instructional Materials Center.

- Penner, K. P. (1996). *Care and handling of deer from field to table*. Retrieved March 23, 2006, from <u>http://www.oznet.ksu.edu/library/fntr2/mf2176.pdf</u>
- Romans, J. R., Costello, W. J., Carlson, C. W., & Greaser, M. L. (2001). *The meat we eat* (14th ed.). Danville, IL: Interstate.

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Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Observe the automated processing of	Teaching:
various types of meat.	• Take students on a field trip or show a
a. Observe step by step procedures for	video about processing plants. Lead
the automated slaughtering and	students in a discussion about automated
fabrication processing of beef, pork,	processing of beef, pork, lamb, poultry,
lamb, poultry, and fish.	and fish.
b. Observe step by step procedures for	 Have students describe step by step
the automated canning processing of	procedures of automated processing of
beef, pork, poultry, and fish.	beef, pork, lamb, poultry, and fish to
	include slaughtering, fabrication, and
	canning processes, as appropriate.
	 Have students use magazines or the
	Internet to research new technologies in
	automated processing and develop a
	bulletin board or brochure about the
	product.
	• Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	 Evaluate student list of processing
	procedures.
	•—Assess technologies project for content
	and appearance.
	• Review summary of unit for understanding
	of material and reteach as needed.

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- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.
- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.

21st Century Skills

CS1 Global Awareness

- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
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- CS5 Thinking and Problem Solving Skills
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Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Explain quality and yield grades for beef	Teaching:
 Explain quality and yield grades for beef and determine classifications of beef. a. Explain quality grades for beef. b. Explain yield grades of beef. c. Determine classification of beef. d. Estimate amount of kidney fat, pelvic fat, and age. e. Estimate amount of marbling in a ribeye. 	 Teaching: Show students quality and yield grades for various animals and have them determine classifications. Show videos on quality grades, yield grades, classification, and estimation. Have students summarize key points. Have students use artificial meat models to practice grading and classification. Have students explain quality grades for beef to include prime, choice, select, standard, commercial, utility, cutter, and canner. Have student explain yield grades of beef to include 1, 2, 3, 4, and 5. Have student determine classification of beef to include bull, cow, heifer, steer, and stag. Have student estimate amount of kidney, pelvic fat, and age. Have student estimate amount of marbling in a ribeye. Assessment: Review video summary for content. Monitor student work using the Activity
	Performance Rubric located in Appendix
 Explain quality grades and determine classification of pork. a. Explain quality grades for pork. b. Determine classification of pork. 	 Teaching: Show students quality and yield grades for various animals and have them determine classifications. Show videos on quality grades, yield grades, classification, and estimation. Have students summarize key points. Have students use artificial meat models to practice grading and classification. Have student explain quality grades for pork to include US1, US2, US3, Medium, and cull. Have student determine classification of pork to include barrow, gilt, boar, sow, and stage

	Assessment:
	Review video summary for content.
	 Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
3. Explain quality and yield grades for lamb	Teaching:
and determine classifications of sheep.	• Show students quality and yield grades for
a. Explain quality grades of lamb.	various animals and have them determine
b. Explain yield grades of lamb.	classifications.
c. Determine classification of sheep.	• Show videos on quality grades, vield
1	grades, classification, and estimation.
	Have students summarize key points.
	Have students use artificial meat models to
	practice grading and classification
	Have student explain quality grades of
	lamb to include prime choice good
	utility and cull
	 Have student explain yield grades of lamb
	to include 1 2 3 4 and 5
	Have student determine classification of
	sheep to include lamb yearling and
	mutton
	Assessment:
	Assessment. Deview video summary for content
	• Monitor student work using the Activity
	Performance Rubric located in Appendix
	D
4 Explain grades in poultry	Topohing:
- Explain grades of poultry	• Show students quality and yield grades for
b Discuss poultry classifications	various animals and have them determine
0. Discuss pount y classifications.	classifications
	Show videos on quality grades vield
	grades classification and estimation
	Have students summarize key points
	Have students summarize key points.
	•
	various products or shipped and prepare a
	various products are simpled and prepare a
	Witten report. Have students use estificial most models to
	• <u></u>
	Practice gracing and classification.
	•
	Include A grade and plant grade.
	• Have each student summarize what he or
	sne learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to

ensure mastery.
Assessment:
 Review video summary for content.
 Evaluate poultry report using the Written
Report Checklist located in Appendix D.
 Monitor student work using the Activity
Performance Rubric located in Appendix
D.
- Review summary of unit for understanding
of material and reteach as needed.

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- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
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- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS5 Utilize technology to accomplish AFNR business objectives.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A2 Recognize, create, extend, and apply patterns, relations, and functions and their applications.
- A3 Simplify algebraic expressions, solve and graph equations, inequalities and systems in one and two variables.
- A4 Explore and communicate the characteristics and operations of polynomials.
- A5 Utilize various formulas in problem solving situations.
- A6 Communicate using the language of algebra.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
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- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.
- H4 Demonstrate the ability to use social studies tools (e.g., timelines, maps, globes, resources, graphs, a compass, technology, etc.).

21st-Century Skills

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- Butler, M., & McCain J. (n.d.). *Beef grading: Yield* [Video]. Lubbock, TX: Creative Education Video.
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Competencies and Suggested Objectives	Suggested Strategies for Competencies
1. Explain and demonstrate meat curing and	Teaching:
smoking processes.	 Have students define curing, smoking, and
a. Define curing, smoking, and sausage	sausage making terms to include artery
making terms.	cure, cover pickle, emersion cure, injection
b. Describe the functions of curing and	cure, overhaul, quick cure, salinometer,
smoking.	and stitch or gun and create a dictionary.
c. Describe meat curing ingredients and	 Discuss the functions of curing and
calculate correct amount of each.	smoking to include color development
d. Explain methods of meat curing.	(internal and external), flavor
e. Identify and use equipment used in	development, preservation, and shelf life
smoking and curing process.	extension.
f. Cure bacon in brine solution.	 Explain meat curing ingredients including
g. Cure jowl in brine solution.	salt, sugar, nitrite and nitrate, sodium
h. Pump shoulders.	erythorbate and ascorbate, alkaline
i. Pump hams.	phosphates, spices and flavorings, and
j. Pump loin.	water. Have each student calculate the
k. Smoke shoulder, ham, loins, bacon,	correct amount of each.
and jowls in smoker.	 Discuss and demonstrate meat curing
	methods and describe their effect on
	product weight and grade to include dry
	salt cure, dry sugar cure, box curing, hot
	salt cure, sweet pickle cure, combination
	cure, pump pickling, and artery cure.
	• Have students identify and use equipment
	used in smoking and curing process to
	include grinder, stuffer, mixer, casing,
	pump, curing tank, ham hooks, bacon
	hooks, stockinette, smoke sticks, and
	smoke house.
	• Have students cure bacon in brine solution,
	cure jowl in brine solution, pump
	snoulders, pump nams, and pump loin.
	Have students work in groups to research
	now climate affects the various spices used
	throughout the world in curing, smoking,
	and sausage making. Have each group
	anions and types of mosts produced in
	spices, and types of means produced in
	various areas. Hove each student develop a sevence
	 nave cach student develop a sausage reging bring the metarials to make the
	sausage, prepare the sausage, develop a
	 Have students work in groups to research how climate affects the various spices used throughout the world in curing, smoking, and sausage making. Have each group develop a map indicating the climate, spices, and types of meats produced in various areas. Have each student develop a sausage recipe, bring the materials to make the sausage, prepare the sausage, develop a

	label and marketing scheme, and present
	the product to the class for peer-review.
	Assessment:
	 Review dictionary for accuracy.
	 Assess calculations for correctness.
	 Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
	 Evaluate map for accuracy and
	appearance.
2. Explain and demonstrate sausage	Teaching:
making.	• Explain and demonstrate sausage making
a. Mix and grind sausage with cure and	processes.
seasoning.	• Have students mix and grind sausage with
b. Read a salinometer.	cure and seasoning.
c. Prepare a brine solution.	 Have students read a salinometer.
d. Stuff sausage in casing.	 Have students prepare a brine solution.
e. Smoke sausage in smoker.	• Have students stuff sausage in casing.
	• Have students smoke sausage in smoker.
	• Have each student summarize what he or
	she learned about the unit and place the
	summary in his or her notebook. Review
	the notebooks and reteach as appropriate to
	ensure mastery.
	Assessment:
	 Monitor student work using the Activity
	Performance Rubric located in Appendix
	D.
	•—Review summary of unit for understanding
	of material and reteach as needed.

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- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.
- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS2 Practice good record keeping to accomplish AFNR business objectives.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
- ABS5 Utilize technology to accomplish AFNR business objectives.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.

- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H1 Explain how geography, economics, and politics have influenced the historical development of the United States in the global community.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.
- H4 Demonstrate the ability to use social studies tools (e.g., timelines, maps, globes, resources, graphs, a compass, technology, etc.).

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem Solving Skills
- CS6 Interpersonal and Self-Directional Skills

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- Romans, J. R., Costello, W. J., Carlson, C. W., & Greaser, M. L. (2001). *The meat we eat* (14th ed.). Danville, IL: Interstate.

Weiss, E., & Weiss, H. (1991). Catering handbook. New York: John Wiley & Sons.
Competencies and Suggested Objectives	Suggested Strategies for Competencies		
1. Investigate new and emerging	Teaching:		
technologies, practices, trends, and issues	 Have each student conduct research and 		
associated with Food Products (Meats).	prepare a report on a new or emerging		
a. Prepare a report on a new and	technology, trend, or issue associated with		
emerging technology associated with	Food Products (Meats).		
Food Products (Meats).	Assessment:		
b. Prepare a report on a current trend or	 Evaluate report using the Written Report 		
issue associated with Food Products	Assessment Rubric located in Appendix D.		
(Meats).			
2. Complete school to careers activities	Teaching:		
related to Food Products (Meats).	• Have each student participate in a school-		
a. Participate in a school-to-careers	to-careers activity such as a shadowing or		
activity (shadowing, mentoring,	mentoring experience, or a career fair.		
career fair, etc.) related to Food	 Have students work in groups to 		
Products (Meats).	investigate postsecondary educational		
b. Investigate educational opportunities	opportunities at the community/junior		
related to Food Products (Meats) at	college, four-year college, and		
the postsecondary level.	apprenticeship level and prepare a chart,		
c. Describe national standards and	electronic presentation, or booklet.		
certification/licensing procedures	 Have students work in groups to 		
related to Food Products (Meats).	investigate any national standards that		
d. Describe the role of trade	apply to Food Products (Meats) and		
organizations, associations, and	prepare a written report on national or		
unions as related to Food Products	regional certification or licensure programs		
(Meats).	or agencies.		
	 Have each student identify trade 		
	associations, professional organizations,		
	and unions associated with Food Products		
	(Meats) and describe how their role affects		
	employees in an oral presentation.		
	Assessment:		
	 Monitor student participation in school-to- 		
	careers activity.		
	• Evaluate educational opportunities product		
	for content and appearance.		
	 Assess certification/licensure report using 		
	the Written Report Checklist located in		
	Appendix D.		
	 Evaluate organization presentation using 		
	the Presentation Checklist located in		
	Appendix D.		
3. Demonstrate related academic skills and	Teaching:		

	workplace skills associated with Food	•	-Have students work in groups to complete
	Products (Meats).		a cooperative project such as a paper,
	a. Complete a cooperative project		presentation, or demonstration associated
	(paper, presentation, or		with a related academic subject.
	demonstration) associated with an	•	Lead students to practice human relations
	academic subject and Food Products		skills such as team participation,
	(Meats).		client/customer service, and negotiation
	b. Practice human relations skills (team		throughout the year in Food Products
	participation, client/customer service,		(Meats).
	leadership, negotiation, working with	•	-Have students research acceptable work
	culturally diverse groups, etc.) related		ethics and determine employer
	to Food Products (Meats).		expectations for persons employed in Food
	c. Research work ethics and employer		Products (Meats) by interviewing
	expectations of employees in Food		employers, supervisors, and employees
	Products (Meats).		and reporting back to the class.
		As	sessment:
		•	<u>-Evaluate cooperative project for content.</u>
		•	<u>Monitor practice of human relations skills.</u>
		•	-Assess report on work ethics and employer
			expectations for content and presentation.
4	Investigate the concepts of quality	Te	aching:
	assurance as related to Food Products		<u>Lead a discussion of the concepts of</u>
	(Meats)		quality assurance and the methods that can
	a Describe quality concepts and		be used to measure quality and gauge
	methods for measuring quality related		quality improvement as related to Food
	to Food Products (Meats).		Products (Meats).
	b. Apply quality concepts in the Food		-Have students apply quality concepts in
	Products (Meats) laboratory	-	the Food Products (Meats) by measuring
	riouueis (intens) neormory.		the quality of their work and charting the
			increase in quality over time.
		As	sessment:
		•	<u>Evaluate student assignment to chart</u>
		-	quality increase over time in school
			laboratory or work experience for content
			and appearance.
5	Examine trends and changes related to	Te	aching:
5.	Food Products (Meats) and global	•	<u>-Lead a discussion of the different concepts</u>
	economic factors.		of global economics and competition as
	a Define and discuss the concept of		related to Food Products (Meats)
	alobal economics and competition	•	<u>Lead a discussion using current</u>
	b Describe global economic factors and		newspaper and magazine articles on
	competition as related to Food		specific issues related to Food Products
	Products (Meats)		(Meats) and global economics and
	c Identify regions and other countries		competition Identify other countries
	which compete in Food Products		which compete with products made in the
	(Meats)		United States
	(11000).		Child Duild.

• Have students determine other regions and
countries that affect competition in Food
Products (Meats) and describe in an oral
presentation ways in which this
competition affects workers.
 Have each student summarize what he or
she learned about the unit and place the
summary in his or her notebook. Review
the notebooks and reteach as appropriate to
ensure mastery.
Assessment:
 Monitor student participation in
discussions.
 Evaluate competition report for content
and presentation.
• Review summary of unit for understanding
of material and reteach as needed.

STANDARDS

Agriculture, Food, and Natural Resources Standards

The following standards were adapted from the publication, *Career Cluster Resources for Agriculture, Food, and Natural Resources.* The complete text of this document can be found at <u>http://www.careerclusters.org/ClusterDocuments/agdocuments/AGFinal.pdf</u>.

- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
- FPP1 Apply principles of food processing to maintain equipment and facilities.
- FPP2 Apply principles of food science to the food industry.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.
- ANM2 Recognize animal behaviors to facilitate working with animals safely.
- ANM3 Provide proper nutrition to maintain animal performance.
- ANM4 Know the factors that influence an animal's reproductive cycle to explain species response.
- ANM5 Identify environmental factors that affect an animal's performance.

TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR.

- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
- NRS4 Employ knowledge of natural resource industries to describe production practices and processing procedures.
- NRS5 Practice responsible conduct to protect natural resources.
- ENV2 Identify public policies and regulations impacting environmental services to determine their effect on facility operations.
- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
- ABS2 Practice good record keeping to accomplish AFNR business objectives.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
- ABS5 Utilize technology to accomplish AFNR business objectives.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.

Academic Standards

- A1 Recognize, classify, and use real numbers and their properties.
- A5 Utilize various formulas in problem solving situations.
- A8 Analyze data and apply concepts of probability.
- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- B2 Investigate the biochemical basis of life.
- B3 Investigate cell structures, functions, and methods of reproduction.
- B5 Investigate the principles, mechanisms, and methodology of classical and molecular genetics.
- B6 Investigate concepts of natural selection as they relate to diversity of life.
- B7 Investigate the interdependence and interactions that occur within an ecosystem.
- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
- E4 Work individually and as a member of a team to analyze and interpret information, to make decisions, to solve problems, and to reflect, using increasingly complex and abstract thinking.
- E5 Complete oral and written presentations which exhibit interaction and consensus within a group.

- E9 Sustain progress toward fluent control of grammar, mechanics, and usage of standard English in the context of writing and speaking.
- E10 Use language and critical thinking strategies to serve as tools for learning.
- H1 Explain how geography, economics, and politics have influenced the historical development of the United States in the global community.
- H2 Describe the impact of science and technology on the historical development of the United States in the global community.
- H3 Describe the relationship of people, places, and environments through time.
- H4 Demonstrate the ability to use social studies tools (e.g., timelines, maps, globes, resources, graphs, a compass, technology, etc.).
- H5 Analyze the contributions of Americans to the ongoing democratic process to include civic responsibilities.

21st Century Skills

- CS1 Global Awareness
- CS2 Financial, Economic, and Business Literacy
- CS3 Civic Literacy
- CS4 Information and Communication Skills
- CS5 Thinking and Problem-Solving Skills
- CS6 Interpersonal and Self-Directional Skills

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MEATing Place. (n.d.). Retrieved March 23, 2006, from http://www.meatingplace.com/

The National Provisioner. (n.d.). Retrieved March 23, 2006, from <u>http://www.nationalprovisioner.com/</u>

The Packaging Digest. (n.d.). Retrieved March 23, 2006, from http://www.packagingdigest.com/

Recommended Tools and Equipment

CAPITALIZED ITEMS

- 1. Grinder (1 per program)
- 2. Mixer (1 per program)
- 3. Band saw (1 per program)
- 4. Tenderizer with table (1 per program)
- 5. Slicer, automatic, with table (1 per program)
- 6. Slicer, manual, with table (1 per program)
- 7. Stuffer, hydraulic (1 per program)
- 8. Table, stainless steel, 3' x 8' (3 per program)
- 9. Table, boning, 3' x 8' (2 per program)
- 10. Rail system with hoist, scales, and easy drop off (1 per program)
- 11. Patty machine with table (1 per program)
- 12. Saw, carcass split (1 per program)
- 13. Platform scales with table (1 per program)
- 14. Smoker truck, stainless steel (1 per program)
- 15. Pickle pump (1 per program)
- 16. Sink, double, stainless steel (1 per program)
- 17. Hand wash basin, stainless steel (1 per program)
- 18. Freezer, walk-in, 10' x 15' (1 per program)
- 19. Cooler, walk-in, 10' x 15' (1 per program)
- 20. Power washer (1 per program)
- 21. Washer, clothes (1 per program)
- 22. Dryer, clothes (1 per program)
- 23. Hot water heater, 100 gallon size (1 per program)
- 24. Dehairing machine (1 per program)
- 25. Table, break down, 3' x 8' (2 per program)
- 26. Vacuum packing machine with table (1 per program)
- 27. Stuffing table, 3' x 8' (1 per program)
- 28. Immobilizer (1 per program)
- 29. Vacuum tumbler (1 per program)
- 30. Computer (1 per 4 students)
- 31. Printer (1 per 4 students)

NON-CAPITALIZED ITEMS

- 1. Aprons (30 per program)
- 2. Hard hats (30 per program)
- 3. Safety glasses (30 pairs per program)
- 4. Rubber boots (30 pairs per program)
- 5. Safety gloves (30 pairs per program)
- 6. Safety aprons (30 per program)
- 7. Steels (30 per program)
- 8. Sharpening hones (16 per program)

9. Band saw blades (10 per program)

10. Handsaw (3 per program)

11. Handsaw blades (10 per program)

- 12. Grinder knives (10 per program)
- 13. Boning knives (30 per program)
- 14. Butcher knives (10 per program)

15. Rail hooks (30 per program)

16. Heat seal machine (1 per program)

17. Knife sterilizer (2 per program)

18. Knife and steel racks (5 per program)

19. Paper racks (4 per program)

20. High pressure water hose, 50' (1 per program)

21. Knife and steel scabbards (30 per program)

22. Stocking hooks (30 per program)

23. Freezer trucks (6 per program)

24. Freezer baskets (50 per program)

25. Plastic lugs (20 per program)

26. Portable lugs (20 per program)

- 27. Brine vats (6 per program)
- 28. Salinometer (1 per program)

29. Weight scales, small (1 per program)

30. Skinning knives (20 per program)

31. Gambrel (10 per program)

32. Thermometer (5 per program)

33. First aid kit with supplies for 20 students (1 per program)

34. Hair net (1 per student)

RECOMMENDED INSTRUCTIONAL AIDS

It is recommended that instructors have access to the following items:

1. VCR (1 per program)

2. Screen, projection (1 per program)

3. Monitor, 25" color (1 per program)

4. A/V stand (1 per program)

5. Internet access

Student Competency Profile for Food Products (Meats) I

Student:

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Careers and Leadership

Explain career opportunities in meat cutting, packing, and processing professions.
 Explain the leadership opportunities and activities which are beneficial to students in meat cutting, packing, and processing.

Unit 2: Orientation to Meat Processing

<u>Explain trends in slaughtering and processing in the past and in the future.</u>
 <u>Describe factors affecting consumer food spending.</u>

Unit 3: Safety, Sanitation, Equipment, and Facility Maintenance

- <u>____1. Explain general meat laboratory safety requirements.</u>
- <u>____2</u>. Discuss sanitation as it applies to a meat cutting facility.
- <u>____3. Discuss federal regulations relating to meat processing.</u>
- _____4. Identify and use equipment for meat cutting, packing, and processing.
- <u>____5.</u> Demonstrate equipment maintenance used in a meat cutting facility.
- <u>_____6. Maintain a safe and sanitary facility.</u>

Unit 4: Custom Livestock Slaughter

- _____1. Explain terms and procedures associated with livestock slaughter.
- <u>____2</u>. Discuss types, cleaning, use, and maintenance of slaughter facility and equipment.
- <u>____3. Discuss procedures for slaughtering livestock and dressing wild game.</u>

Unit 5: Pricing, Wrapping, and Marketing

- <u>—___1.</u> Compare and contrast consumer trends, supply and demand, and the effects on meat prices.
- <u>____2</u>. List the steps and perform a cutting test.

<u>____3. Discuss techniques and wrap retail meat.</u>

<u>4. Describe marketing principles related to the display of meat.</u>

Unit 6: Special Topics in Food Products (Meats) I (Ongoing)

- <u>1.</u> Investigate new and emerging technologies, practices, trends, and issues associated with Food Products (Meats).
- <u>2. Complete school-to-careers activities related to Food Products (Meats).</u>
- <u>____3.</u> Demonstrate related academic skills and workplace skills associated with Food Products (Meats).
- _____4. Investigate the concepts of quality assurance as related to Food Products (Meats).
- <u>5. Examine trends and changes related to Food Products (Meats) and global economic factors.</u>

Student Competency Profile for Food Products (Meats) II

Student:

This record is intended to serve as a method of noting student achievement of the competencies in each unit. It can be duplicated for each student and serve as a cumulative record of competencies achieved in the course.

In the blank before each competency, place the date on which the student mastered the competency.

Unit 1: Identification and Fabrication of Carcass and Box Beef

Identify and fabricate cuts of beef.
 Identify and fabricate variety cuts of beef.

Unit 2: Identification and Fabrication of Carcass and Box Pork

<u>I. Identify and fabricate cuts of pork.</u> <u>2. Identify and fabricate retail variety cuts of pork.</u>

Unit 3: Identification and Fabrication of Carcass Lamb and Goat

<u>I. Identify and fabricate cuts of lamb and goat.</u>

Unit 4: Identification and Fabrication of Poultry and Fish

_____1. Identify and fabricate cuts of poultry.

<u>____2. Identify variety cuts of poultry.</u>

<u>____3. Identify retail cuts of fish.</u>

Unit 5: Identification and Fabrication of Wild Game

<u>1. Identify and fabricate cuts of wild game.</u> <u>2. Prepare wild game specialty products.</u>

Unit 6: Automated Processing of Meats

<u>1. Observe the automated processing of various types of meat.</u>

Unit 7: Quality and Yield Grading

- _____1. Explain quality and yield grades for beef and determine classifications of beef.
- _____2. Explain quality grades and determine classification of pork.
- <u>____3. Explain quality and yield grades for lamb and determine classifications of sheep.</u>
- <u>4. Explain grades in poultry.</u>

Unit 8: Curing, Smoking, and Sausage Making

- _____1. Explain and demonstrate meat curing and smoking processes.
- <u>____2. Explain and demonstrate sausage making.</u>

Unit 9: Special Topics in Food Products (Meats) II

- <u>1.</u> Investigate new and emerging technologies, practices, trends, and issues associated with Food Products (Meats).
- <u>2. Complete school to careers activities related to Food Products (Meats).</u>
- <u>____3.</u> Demonstrate related academic skills and workplace skills associated with Food Products (Meats).
- <u>4. Investigate the concepts of quality assurance as related to Food Products (Meats).</u>
- <u>5. Examine trends and changes related to Food Products (Meats) and global economic factors.</u>

ASSESSMENT

BLUEPRINT

Title of Program & Code: SEC Food Products (Meats); 40NS

Program Level: Secondary

This program is assessed using the MS-CPAS. The following blueprint summary contains the competencies that are measured when assessing this program. Competencies are grouped into *clusters* and a weight is given to each cluster to determine the number of items needed from each cluster. The numbers of C1s and C2s (item difficulty levels) are also indicated on the blueprint.

Cluster/Competency	Level 1 (C1)	Level 2 (C2)	TOTAL	<u>⁰⁄₀</u>
	Number	Number		
Cluster 1: Careers, Orientation, & Safety Careers and Leadership Orientation to Meat Processing Safety, Sanitation, Equipment, & Facility Maintenance	23	7		30
Cluster 2 : Slaughter Custom Livestock Slaughter	8	3		44
Cluster 3: Marketing and Grading Pricing, Wrapping, and Marketing Quality and Yield Grading	9	3		12
Cluster 4:Identification and FabricationIdentification & Fabrication of Carcass & Box BeefIdentification & Fabrication of Carcass & Box PorkIdentification & Fabrication of Carcass Lamb & GoatIdentification & Fabrication of Poultry & FishIdentification & Fabrication of Wild Game	30	10		40
Cluster 5: Processing Meats Automated Processing of Meats Curing, Smoking, and Sausage Making	5	2		7
Total Questions:	75	25		100%

Appendix A: Agriculture, Food, and Natural Resources Standards¹

The following standards were adapted from the publication, *Career Cluster Resources for Agriculture, Food, and Natural Resources.* Each standard represents a pathway knowledge and skill statement as listed in this document. Standards are clustered by career pathway. The complete text of this document can be found at

http://www.careerclusters.org/ClusterDocuments/agdocuments/AGFinal.pdf

LEADERSHIP (LEA)

- LEA1 Use leadership skills in collaborating with others to accomplish organizational goals and objectives.
 - a. Embrace empowerment, risk, communication, focusing on results, decision making, problem solving, investment in individuals, and resource use and access to develop premier leadership.
 - b. Embrace compassion, service, listening, coaching, developing others, team development, and understanding and appreciating others to develop premier leadership.
 - c. Embrace enthusiasm, creativity, the future, conviction, mission, courage, concept, focus, principles, and change to develop premier leadership.
 - d. Embrace integrity, courage, values, ethics, humility, perseverance, self-discipline, and responsibility to develop premier leadership.
 - e. Include self, community, diversity, environment, global awareness, and knowledge to develop premier leadership.
 - f. Embrace innovation, intuition, adaptation, life-long learning, and coachability to develop premier leadership.
- LEA2 Use personal growth skills in collaborating with others to accomplish organizational goals and objectives.
 - a. Embrace attitude, exercise, goal setting, planning, self discipline, sense of balance, persistence, and respect to develop personal growth.
 - b. Embrace friendship, integrity, morals, values, etiquette, citizenship, cross-cultural awareness, acceptance/change, and respect for differences to develop personal growth.
 - c. Embrace goal setting, planning, decision making, principles, respect, attitude, dependability, loyalty, trustworthiness, and communication to develop personal growth.
 - d. Embrace learning, critical thinking, reasoning, creative thinking, attitude, dependability, decision-making, and problem solving to develop personal growth.
 - e. Embrace attitude, self-discovery, coping, friendship, self-reliance, sense of balance, empathy, compassion, and integrity to develop personal growth.
 - f. Embrace ethics, coping, courage, attitude, self-image/worth, values, principles, and sense of balance to develop personal growth.

¹ Career Cluster Resources for Agriculture, Food, and Natural Resources. Retrieved September 21, 2005, from <u>http://www.careerclusters.org/ClusterDocuments/agdocuments/AGFinal.pdf</u>

ETHICS AND LEGAL RESPONSIBILITIES (ELR)

- ELR1 Know and understand the importance of professional ethics and legal responsibilities.
 - a. Apply knowledge of professional and workplace ethics and legal responsibilities to organize guidelines for workplace conduct.
 - b. Apply ethical and legal reasoning to workplace situations.
 - c. Review appropriate resources to identify national and international rules associated with a desired career.
 - d. Identify what ethical issues and concerns affect a desired career field to assist in making career decisions.
- ELR2 Demonstrate workplace ethics specific to Agriculture, Food, and Natural Resources (AFNR) occupations.
 - a. Evidence interest and concern to demonstrate natural resource stewardship and ethics.
 - b. Exercise personal habits and actions to demonstrate workplace ethics.

FOOD PRODUCTS AND PROCESSING SYSTEMS (FPP)

- FPP1 Apply principles of food processing to maintain equipment and facilities.
 - a. Develop management plans to maintain equipment and facilities.
 - b. Interpret and follow, develop, and implement Hazardous Critical Control Point (HACCP) procedures to establish operating parameters.
- FPP2 Apply principles of food science to the food industry.
 - a. Apply food science principles to enhance product development.
- FPP3 Plan, implement, manage, and/or provide services for the preservation and packaging of food and food products.
 - a. Analyze product preparation options to prepare products for distribution.
 - b. Compare and select food preservation methods to develop food preservation programs.
- FPP4 Identify processing, handling, and storage factors to show how they impact product quality and safety.
 - a. Develop a "quality factors program" to comply with local, national, and governmental, and international standards.
 - b. Develop slaughter/inspection techniques to process foods and analyze food product options.

PLANT SYSTEMS (PLT)

- PLT1 Apply principles of anatomy and physiology to produce and manage plants in both a domesticated and a natural environment.
 - a. Analyze and evaluate nutritional requirements and environmental conditions to develop and implement a fertilization plan.
 - b. Test appropriate materials or examine data to evaluate and manage soil/media nutrients.
 - c. Explain and use basic methods for reproducing and propagating plants.
 - d. Develop and use a plan for integrated pest management.

- PLT2 Address taxonomic or other classifications to explain basic plant anatomy and physiology.
 - a. Examine unique plant properties to identify/describe functional differences in plant structures including roots, stems, flowers, leaves, and fruit.
 - b. Classify plants on physiology for taxonomic or other classifications.
- PLT3 Apply fundamentals of production and harvesting to produce plants.
 a. Apply fundamentals of plant management to develop a production plan.
 b. Apply fundamentals of plant management to harvest, handle, and store crops.
- PLT4 Exercise elements of design to enhance an environment (e.g., floral, forest, landscape, and farm).

a. Apply basic design elements and principles to create a design using plants.

ANIMAL SYSTEMS (ANM)

- ANM1 Apply knowledge of anatomy and physiology to produce and/or manage animals in a domesticated or natural environment.
 - a. Use classification systems to explain basic functions of animal anatomy and physiology.
 - b. Recognize the anatomy of animal species to understand how the body structures interact and affect animal health.
 - c. Analyze a subject animal to determine the nature of its health status.
- ANM2 Recognize animal behaviors to facilitate working with animals safely.
 - a. Develop a safety plan for working with a specific animal.
- ANM3 Provide proper nutrition to maintain animal performance.
 - a. Examine animal developmental stages to comprehend why nutrient requirements are different throughout an animal's life cycle.
 - b. Analyze a feed ration to determine whether or not it fulfills a given animal's nutrient requirements.
 - c. Record and compare feed variations to assess whether the nutritional requirements of an animal are being met.
- ANM4 Know the factors that influence an animal's reproductive cycle to explain species response.
 - a. Analyze elements in the reproductive cycle to explain differences in the male and female reproductive systems.
 - b. Discuss reproductive cycles to show how they differ from species to species.
 - c. Evaluate an animal to determine its breeding soundness.
- ANM5 Identify environmental factors that affect an animal's performance.
 - a. Recognize optimum performance for a given animal species.
 - b. Create a program to develop an animal to its highest potential performance.
 - c. Assess an animal to determine if it has reached its optimum performance level.
 - d. Develop efficient procedures to produce consistently high-quality animals, wellsuited for their intended purposes.
- TOOLS, EQUIPMENT, TECHNOLOGY, AND SAFETY (TET)
- TET1 Use tools, equipment, machinery, and technology to work in areas related to AFNR. a. Select the appropriate tool to perform a given task.

- b. Keep tools in good working order for efficient work use.
- c. Wear protective equipment and handle natural resource tools and equipment with skill to demonstrate safe use of tools and equipment.

POWER SYSTEMS (PWR)

- PWR1 Apply physical science principles to engineering applications with mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
 - a. Relate power generation to energy sources.
 - b. Apply principles of lubricants to sort and classify lubricants.
- PWR2 Apply principles of operation and maintenance to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
 - a. Perform scheduled service routines to maintain machinery and equipment.
 - b. Observe rules of the road to operate machinery and equipment.
- PWR3 Apply principles of service and repair to mechanical equipment, structures, biological systems, land treatment, power utilization, and technology.
 - a. Troubleshoot problems and evaluate performance to service and repair components of internal combustion engines.
 - b. Follow manufacturer's guidelines to service and repair power transmission systems.
 - c. Evaluate performance and check maintenance manuals to service and repair hydraulic lines.
 - d. Troubleshoot from schematics to service vehicle electrical systems.
 - e. Use company diagrams and scenarios to service vehicle heating and air conditioning systems.
 - f. Check performance parameters to service and repair steering, suspension, traction, and vehicle performance systems.
 - g. Use tools in the workplace to demonstrate safe and proper skills with construction/fabrication hand tools.

STRUCTURAL SYSTEMS (STR)

STR1 Exercise basic skills in blueprint and design development to create sketches, drawings, and plans.

a. Use computer skills to develop simple sketches and plans.

- STR2 Read and relate structural plans to specifications and building codes.
 a. Examine blueprints and local codes to develop a logical construction plan.
- STR3 Examine structural requirements to estimate project costs.
 - a. Use bids and billing information to develop a complete materials list and project cost estimate.
- STR4 Develop skills required to use construction/fabrication equipment and tools.
 - a. Use tools in the workplace to demonstrate safe and proper skills with construction/fabrication hand tools.
- STR5 Plan, implement, manage, and/or provide support services for facility design and construction; equipment design, manufacture, repair, and service; and agricultural technology.

- a. Design machinery and equipment including vehicles, implements, buildings, and facilities (e.g., feeding, feed storage).
- b. Follow architectural and mechanical plans to construct buildings and facilities.

TECHNICAL SYSTEMS (TEC)

- TEC1 Use a variety of tools available in computer systems to accomplish fast, accurate production in the workplace.
 - a. Identify and explain the various types of hardware systems to show their applications and potentials.
- TEC2 Use available power sources to plan and apply control systems.
 - a. Measure with selective instruments to demonstrate knowledge of basic electricity.
 - b. Reference electrical drawings to design, install, and troubleshoot control systems.
- TEC3 Explain geospatial technology to demonstrate its applications.
 - a. Employ appropriate techniques to demonstrate application of GPS/GIS systems principles.
 - b. Use computer applications to produce maps that reflect surveying and mapping principles.
 - c. Select an area of personal expertise to demonstrate knowledge of end applications.

NATURAL RESOURCE SYSTEMS (NRS)

- NRS1 Recognize importance of resource and human interrelations to conduct management activities in natural habitats.
 - a. Identify resource management components to establish relationships in natural resource systems.
 - b. Apply cartographic skills to natural resource activities.
 - c. Monitor natural resource status to obtain planning data.
 - d. Employ environmental and wildlife knowledge to demonstrate natural resource enhancement techniques.
 - e. Examine weather and other criteria to recognize dangers related to work in an outdoor environment.
 - f. Learn applicable rules or laws to demonstrate natural resource mitigation techniques.
- NRS2 Use effective venues to communicate natural phenomena to the public.
 - a. Communicate natural resources information to the general public.
 - b. Personally interpret natural resource phenomena to natural resource users.
- NRS3 Apply scientific principles to natural resource management activities.
 - a. Use science concepts, processes, and research techniques to examine natural resource topics.
 - b. Examine biological and physical characteristics to identify and classify natural resources.
 - c. Examine natural cycles and related phenomena to describe ecologic concepts and principles.
- NRS4 Employ knowledge of natural resource industries to describe production practices and processing procedures.

- a. Prepare presentations to describe how natural resource products are produced, harvested, processed, and used.
- NRS5 Practice responsible conduct to protect natural resources.
 - a. Employ techniques and equipment needed to prevent wildfire.
 - b. Use wildfire suppression techniques to demonstrate abilities in firefighting and control.
 - c. Recognize symptoms of animal and plant diseases and use appropriate techniques to prevent their spread.
 - d. Recognize insect types and available controls to prevent insect infestation.
 - e. Use acceptable pesticides to treat insect infestation.
 - f. Know law enforcement procedures to manage public gatherings and to gain entry into secure, closed, or restricted areas.

ENVIRONMENTAL SERVICE SYSTEMS (ENV)

ENV1 Use analysis procedures to plan and evaluate environmental service impacts.

- a. Use instrumentation to monitor samples.
- b. Calibrate and service instruments on a timely schedule to maintain environmental instrumentation.
- c. Apply statistics, charts, and scattergrams to measure and monitor operations.
- ENV2 Identify public policies and regulations impacting environmental services to determine their effect on facility operations.
 - a. Consult reliable resources or training to identify the major laws impacting environmental services.
- ENV3 Apply scientific principles to environmental services.
 - a. Apply meteorological knowledge to recognize weather systems and weather patterns.
 - b. Describe soil composition and properties to demonstrate knowledge of soil science.
 - c. Explain well design and groundwater supplies to demonstrate knowledge of hydrology.
 - d. Discuss properties, classifications, and functions in order to understand wetland principles.
 - e. Discuss properties, classifications, and functions in order to understand watershed principles.
 - f. Use chemical analysis to conduct tests.
 - g. Apply sampling techniques and other assessments to demonstrate background knowledge of microbiology.
- ENV4 Operate environmental service systems (e.g., pollution control, water treatment, wastewater treatment, solid waste management, and energy) to manage a facility environment.
 - a. Use pollution control measures to maintain a safe facility environment.
 - b. Apply principles of solid waste management (landfill) to manage safe disposal of all categories of waste.
 - c. Apply drinking water treatment principles to assure safe drinking water at a facility.
 - d. Apply wastewater treatment operations principles to manage wastewater disposal in keeping with rules and regulations.

- e. Apply hazardous materials management principles to assure a safe facility and to comply with applicable regulations.
- f. Explore conventional and alternative supplies to define energy sources.
- ENV5 Use tools, equipment, machinery, and technology to accomplish tasks in environmental services.
 - a. Use technology tools to map land, facilities, and infrastructure.

AGRIBUSINESS SYSTEMS (ABS)

- ABS1 Employ leadership skills to accomplish goals and objectives in the AFNR business environment.
 - a. Develop a mission statement to guide business activities effectively.
 - b. Apply leadership skills to accomplish general business activities from production to public relations.
 - c. Apply management skills to accomplish general business activities from production to public relations.
- ABS2 Practice good record keeping to accomplish AFNR business objectives. a. Prepare and maintain all files as needed to accomplish effective record keeping.
- ABS3 Apply generally accepted accounting principles and skills to manage budget, credit, and optimal application of AFNR business assets.
 - a. Use key accounting fundamentals to accomplish dependable bookkeeping and associated files.
- ABS4 Employ AFNR industry concepts and practices to manage inventory.
 - a. Monitor inventory levels to accomplish practical inventory control.
- ABS5 Utilize technology to accomplish AFNR business objectives.
 - a. Use technology and information technology strategies for business improvement.
- ABS6 Use marketing and sales principles to accomplish an AFNR business objective.
 - a. Conduct market research.
 - b. Develop a marketing plan.
 - c. Implement a marketing plan.
 - d. Merchandise products and services.

Appendix B: Academic Standards

Algebra I²

A1	Reco	gnize, classify, and use real numbers and their properties.
	a.	Describe the real number system using a diagram to show the relationships of
		component sets of numbers that compose the set of real numbers.
	<u>b.</u>	- Model properties and equivalence relationships of real numbers.
	<u> </u>	- Demonstrate and apply properties of real numbers to algebraic expressions.
	<u>d.</u>	Perform basic operations on square roots excluding rationalizing denominators.
A2—	Reco	gnize, create, extend, and apply patterns, relations, and functions and their
	appli	cations.
	<u>a.</u>	Analyze relationships between two variables, identify domain and range, and
		determine whether a relation is a function.
	<u>b.</u>	Explain and illustrate how change in one variable may result in a change in
		another variable.
		Determine the rule that describes a pattern and determine the pattern given the
		rule.
	<u>d.</u>	Apply patterns to graphs and use appropriate technology.
A3-	<u>Simp</u>	lify algebraic expressions, solve and graph equations, inequalities and systems in
	one a	nd two variables.
	.	Solve, check, and graph linear equations and inequalities in one variable,
		including rational coefficients.
	<u>b.</u>	Graph and check linear equations and inequalities in two variables.
	-c.	Solve and graph absolute value equations and inequalities in one variable.
	d	Use algebraic and graphical methods to solve systems of linear equations and
		inequalities.
	e.	Translate problem solving situations into algebraic sentences and determine
		solutions.
A4—	-Explo	ore and communicate the characteristics and operations of polynomials.
	a .	Classify polynomials and determine the degree.
	<u>b.</u>	Add, subtract, multiply, and divide polynomial expressions.
	-c.	Factor polynomials using algebraic methods and geometric models.
	<u>d.</u>	- Investigate and apply real number solutions to quadratic equations algebraically
		and graphically.
	е.	Use convincing arguments to justify unfactorable polynomials.
	<u>f.</u>	Apply polynomial operations to problems involving perimeter and area.
A5—	<u>Utiliz</u>	e various formulas in problem solving situations.
	a.	Evaluate and apply formulas (e.g., circumference, perimeter, area, volume,
		Pythagorean Theorem, interest, distance, rate, and time).
	<u>-b.</u>	Reinforce formulas experimentally to verify solutions.

² Mississippi mathematics framework—Algebra I. (2003). Retrieved September 10, 2003, from <u>http://www.mde.k12.ms.us/Curriculum/index_1.htm</u>

- c. Given a literal equation, solve for any variable of degree one.
- d. Using the appropriate formula, determine the length, midpoint, and slope of a segment in a coordinate plane.
- e. Use formulas (e.g., point-slope and slope-intercept) to write equations of lines.
- A6 Communicate using the language of algebra.
- a. Recognize and demonstrate the appropriate use of terms, symbols, and notations.
- b. Distinguish between linear and non-linear equations.
- c. Translate between verbal expressions and algebraic expressions.
- d. Apply the operations of addition, subtraction, and scalar multiplication to matrices.
- e. Use scientific notation to solve problems.
- f. Use appropriate algebraic language to justify solutions and processes used in solving problems.
- A7 Interpret and apply slope as a rate of change.
- a. Define slope as a rate of change using algebraic and geometric representations.
- b. Interpret and apply slope as a rate of change in problem-solving situations.
- c. Use ratio and proportion to solve problems including direct variation (y=kx).
- d. Apply the concept of slope to parallel and perpendicular lines.
- A8 Analyze data and apply concepts of probability.
- a. Collect, organize, graph, and interpret data sets, draw conclusions, and make predictions from the analysis of data.
- b. Define event and sample spaces and apply to simple probability problems.
- c. Use counting techniques, permutations, and combinations to solve probability problems.

Biology I³

- B1 Utilize critical thinking and scientific problem solving in designing and performing biological research and experimentation.
- a. Demonstrate the proper use and care for scientific equipment used in biology.
- b. Observe and practice safe procedures in the classroom and laboratory.
- *c.* Apply the components of scientific processes and methods in the classroom and laboratory investigations.
- d. Communicate results of scientific investigations in oral, written, and graphic form.
- B2 Investigate the biochemical basis of life.
- a. Identify the characteristics of living things.
- b. Describe and differentiate between covalent and ionic bonds using examples of each.
- *c.* Describe the unique bonding and characteristics of water that makes it an essential component of living systems.

³ *Mississippi science framework—Biology I.* (2003). Retrieved September 10, 2003, from <u>http://www.mde.k12.ms.us/Curriculum/index_1.htm</u>

	d.	Classify solutions using the pH scale and relate the importance of pH to organism survival.			
	<u>e.</u>	Compare the structure, properties and functions of carbohydrates, lipids, proteins			
		and nucleic acids in living organisms.			
	f.	Explain how enzymes work and identify factors that can affect enzyme action.			
B3	Inve	stigate cell structures, functions, and methods of reproduction.			
	a .	 Differentiate between prokaryotic and eukaryotic cells. 			
	b	 Distinguish between plant and animal (eukaryotic) cell structures. 			
	<u> </u>	 Identify and describe the structure and basic functions of the major eukaryotic organelles. 			
	<u>d.</u>	— Describe the way in which cells are organized in multicellular organisms.			
	<u>е.</u>	Relate cell membrane structure to its function in passive and active transport.			
	f	— Describe the main events in the cell cycle and cell mitosis including differences in			
		plant and animal cell divisions.			
	g	Relate the importance of meiosis to sexual reproduction and the maintenance of			
	5.	chromosome number			
	h	Identify and distinguish among forms of acayual and sayual reproduction			
B /	II. Inve	stiggte the transfer of energy from the sun to living systems.			
υŦ	2	Describe the structure of ATP and its importance in life processes			
	a. h	Examina compare and contrast the basic processes of photosynthesis and collular			
	0.	respiration.			
	-c.	 Compare and contrast aerobic and anaerobic respiration. 			
B5 —	- Investigate the principles, mechanisms, and methodology of classical and molecular				
	gene	xtics.			
	a.	- Compare and contrast the molecular structures of DNA and RNA as they relate to			
		replication, transcription, and translation.			
	<u>b.</u>	- Identify and illustrate how changes in DNA cause mutations and evaluate the			
		significance of these changes.			
		Analyze the applications of DNA technology (forensics, medicine, agriculture).			
	<u> </u>	— Discuss the significant contributions of well-known scientists to the historical			
		progression of classical and molecular genetics.			
	e	<u>Apply genetic principles to solve simple inheritance problems including</u>			
	0.	monohybrid crosses sex linkage multiple alleles incomplete dominance and			
		codominance.			
	f	Evamina inheritance patterns using current technology (gel electrophoresis			
	1.	padigraes karvotypes)			
R6	Invo	stigate concepts of natural selection as they relate to diversity of life			
DO		Analyza how organisms are classified into a hierarchy of groups and subgroups			
	a.	hesed on similarities and differences			
	1.	Dased on similarities and differences.			
	. .	- identify characteristics of kingdoms including monerans, protists, lungi, plants			
		and animals.			
	-с.	Differentiate among major divisions of the plant and animal kingdoms			
		(vascular/non-vascular; vertebrate/invertebrate).			
	<u>d.</u>	Compare the structures and functions of viruses and bacteria relating their impact			
		on other living organisms.			

	е.	- Identify evidence of change in species using fossils, DNA sequences, anatomical
		and physiological similarities, and embryology.
	f	Analyze the results of natural selection in speciation, diversity, adaptation,
		behavior and extinction.
<u>B7</u>	Inves	stigate the interdependence and interactions that occur within an ecosystem.
	a	Analyze the flow of energy and matter through various cycles including carbon,
		oxygen, nitrogen and water cycles.
	b	Interpret interactions among organisms in an ecosystem
		(producer/consumer/decomposer, predator/prey, symbiotic relationships and
		competitive relationships).
	<u> </u>	- Compare variations, tolerances, and adaptations of plants and animals in major
		biomes.
	<u>d.</u>	Investigate and explain the transfer of energy in an ecosystem including food
		chains, food webs, and food pyramids.
	<u>е.</u>	Examine long and short-term changes to the environment as a result of natural
		events and human actions.

English II⁴

- E1 Produce writing which reflects increasing proficiency through planning, writing, revising, and editing and which is specific to audience and purpose.
- a. Produce individual and/or group compositions and/or projects to persuade, tell a story, describe, create an effect, explain or justify an action or event, inform, entertain, etc.
- b. Produce writing typically used in the workplace such as social, business, and technical correspondence; explanation of procedures; status reports; research findings; narratives for graphs; justification of decisions, actions, or expenses; etc.
- c. Write a response, reaction, interpretation, analysis, summary, etc., of literature, other reading matter, or orally presented material.
- d. Revise to ensure effective introductions, details, wording, topic sentences, and conclusions.
- E2 Communicate ideas for a variety of school and other life situations through listening, speaking, and reading aloud.
- a. Listen to determine the main idea and supporting details, to distinguish fact from opinion, and to determine a speaker's purpose or bias.
- b. Speak with appropriate intonation, articulation, gestures, and facial expression.
- c. Speak effectively to explain and justify ideas to peers, to inform, to summarize, to persuade, to entertain, to describe, etc.
- E3 Read, evaluate, and use print, non-print, and technological sources to research issues and problems, to present information, and to complete projects.
 - a. Read, view, and listen to distinguish fact from opinions and to recognize persuasive and manipulative techniques.

⁴ Mississippi language arts framework—English II. (2003). Retrieved September 10, 2003, from <u>http://www.mde.k12.ms.us/Curriculum/index_1.htm</u>

	b	Access both print and non-print sources to produce an I-Search paper, research
		paper, or project.
	-c.	Use computers and audio-visual technology to access and organize information
		for purposes such as resumes, career search projects, and analytical writings, etc.
		Use reference sources, indices, electronic card catalog, and appropriate research
	c.	procedures to gather and synthesize information.
E4 —	Work	individually and as a member of a team to analyze and interpret information. to
2.	make	decisions, to solve problems, and to reflect, using increasingly complex and
	abstra	et thinking.
	a .	Interact with peers to examine real world and literary issues and ideas.
	b.	Show growth in critical thinking, leadership skills, consensus building, and self-
		confidence by assuming a role in a group, negotiating compromise, and reflecting on individual or group work.
<u>E5</u>	Comp	lete oral and written presentations which exhibit interaction and consensus within a
	group	1
		Share, critique, and evaluate works in progress and completed works through a
		process approach.
	<u> </u>	Communicate effectively in a group to present completed projects and/or
		compositions.
		- Edit oral and written presentations to reflect correct grammar, usage, and
	•••	mechanics.
E6 —	- Explo	re cultural contributions to the history of the English language and its literature.
		- Explore a variety of works from various historical periods, geographical locations,
		and cultures, recognizing their influence on language and literature.
	-b	- Identify instances of dialectal differences which create stereotypes perceptions
		and identifies.
		Recognize root words, prefixes, suffixes, and cognates.
	-d	Relate how vocabulary and spelling have changed over time
E7	—Disco	ver the power and effect of language by reading and listening to selections from
1	varior	is literary genres.
	- 8	Listen to and read aloud selected works to recognize and respond to the rhythm
		and nower of language to convey a message
	b	Read aloud with fluency and expression
		Analyze the stylistic devices such as alliteration assonance word order rhyme
	0.	onomatopoeia etc. that make a passage achieve a certain effect.
		Demonstrate how the use of language can confuse or inform, repel or persuade, or
		inspire or enrage.
	<u>е.</u>	Analyze how grammatical structure or style helps to create a certain effect.
<u>E8</u>	Read.	discuss, analyze, and evaluate literature from various genres and other written
	mater	ial.
	<u>a.</u>	Read and explore increasingly complete works, both classic and contemporary.
		for oral discussion and written analysis.
	b	Read, discuss, and interpret literature to make connections to life.
	-с.	Read from a variety of genres to understand how the literary elements contribute
		to the overall quality of the work.
		1 5

	<u>d.</u>	Identify qualities in increasingly complex literature that have produced a lasting
		impact on society.
	е.	Read for enjoyment, appreciation, and comprehension of plot, style, vocabulary,
		etc.
E9 —	Sustain	n progress toward fluent control of grammar, mechanics, and usage of standard
	Englis	h in the context of writing and speaking.
	-a.	Infuse the study of grammar and vocabulary into written and oral communication.
	-b	Demonstrate, in the context of their own writing, proficient use of the conventions
		of standard English, including, but not limited to, the following: complete
		sentences, subject-verb agreement, plurals, spellings, homophones, possessives,
		verb forms, punctuation, capitalization, pronouns, pronoun-antecedent agreement,
		parallel structure, and dangling and misplaced modifiers.
	-c.	Give oral presentations to reinforce the use of standard English.
	<u>d.</u>	Employ increasingly proficient editing skills to identify and solve problems in
		grammar, usage, and structure.
E10	Use la	nguage and critical thinking strategies to serve as tools for learning.
	a.	Use language to facilitate continuous learning, to record observations, to clarify
		thought, to synthesize information, and to analyze and evaluate language.
	-b.	Interpret visual material orally and in writing.

U.S. History from 1877⁵

H1	-Explai	n how geography, economics, and politics have influenced the historical
	develo	pment of the United States in the global community.
	a.	Apply economic concepts and reasoning when evaluating historical and
		contemporary social developments and issues (e.g., gold standard, free coinage of
		silver, tariff issue, laissez faire, deficit spending, etc.).
	-b.	Explain the emergence of modern America from a domestic perspective (e.g.,
		frontier experience, Industrial Revolution and organized labor, reform movements
		of Populism and Progressivism, Women's Movement, Civil Rights Movement,
		the New Deal, etc.).
	-с.	Explain the changing role of the United States in world affairs since 1877 through
		wars, conflicts, and foreign policy (e.g., Spanish-American War, Korean conflict,
		containment policy, etc.).
	<u>d.</u>	Trace the expansion of the United States and its acquisition of territory from 1877
		(e.g., expansionism and imperialism).
H2	-Descri	be the impact of science and technology on the historical development of the
	United	States in the global community.
	a.	Analyze the impact of inventions on the United States (e.g., telephone, light bulb,
		etc.).
	<u>b.</u>	Examine the continuing impact of the Industrial Revolution on the development
		of our nation (e.g., mass production, computer operations, etc.).

⁵ Mississippi social studies framework—U.S. History from 1877. (2003). Retrieved September 10, 2003, from <u>http://www.mde.k12.ms.us/Curriculum/index_1.htm</u>

	-c.	 Describe the effects of transportation and communication advances since 1877.
H3	-Desc	ribe the relationship of people, places, and environments through time.
	<u>a.</u>	Analyze human migration patterns since 1877 (e.g., rural to urban, the Great
		Migration, etc.).
	<u> </u>	Analyze how changing human, physical, geographic characteristics can alter a
		regional landscape (e.g., urbanization, Dust Bowl, etc.).
H4	Dem	onstrate the ability to use social studies tools (e.g., timelines, maps, globes,
	resou	irces, graphs, a compass, technology, etc.).
	a.	Interpret special purpose maps, primary/secondary sources, and political cartoons.
	<u>b.</u>	Analyze technological information on graphs, charts, and timelines.
	е.	Locate areas of international conflict (e.g., Caribbean, Southeast Asia, Europe,
		etc.).
H5—	Anal	yze the contributions of Americans to the ongoing democratic process to include
	civic	responsibilities.
	a.	Examine various reform movements (e.g., Civil Rights, Women's Movement,
		etc.).
	b	Examine the government's role in various movements (e.g., arbitration, 26th
		Amendment, etc.).
	c	Examine the role of government in the preservation of citizens' rights (e.g., 19th
		Amendment, Civil Rights Act of 1964).
	<u> </u>	Examine individuals' duties and responsibilities in a democratic society (e.g.,
		voting, volunteerism, etc.).

Appendix C: 21st Century Skills⁶

CS1 Global Awareness

- Using 21st century skills to understand and address global issues
- Learning from and working collaboratively with individuals representing diverse cultures, religions, and lifestyles in a spirit of mutual respect and open dialogue in personal, work, and community contexts
- Promoting the study of non-English language as a tool for understanding other nations and cultures

CS2 Financial, Economic, and Business Literacy

- Knowing how to make appropriate personal economic choices
- Understanding the role of the economy and the role of business in the economy
- Applying appropriate 21st century skills to function as a productive contributor within an organizational setting
- Integrating oneself within and adapting continually to our nation's evolving economic and business environment

CS3 Civic Literacy

- Being an informed citizen to participate effectively in government
- Exercising the rights and obligations of citizenship at local, state, national, and global levels
- Understanding the local and global implications of civic decisions
- Applying 21st century skills to make intelligent choices as a citizen

CS4 Information and Communication Skills

- Information and media literacy skills: Analyzing, accessing, managing, integrating, evaluating, and creating information in a variety of forms and media; understanding the role of media in society
- Communication skills: Understanding, managing, and creating effective oral, written, and multimedia communication in a variety of forms and contexts

CS5 Thinking and Problem-Solving Skills

- Critical thinking and systems thinking: Exercising sound reasoning in understanding and making complex choices, understanding the interconnections among systems
- Problem identification, formulation, and solution: Ability to frame, analyze, and solve problems
- Creativity and intellectual curiosity: Developing, implementing, and communicating new ideas to others, staying open and responsive to new and diverse perspectives

CS6 Interpersonal and Self-Directional Skills

- Interpersonal and collaborative skills: Demonstrating teamwork and leadership, adapting to varied roles and responsibilities, working productively with others, exercising empathy, respecting diverse perspectives
- Self direction: Monitoring one's own understanding and learning needs, locating appropriate resources, transferring learning from one domain to another
- Accountability and adaptability: Exercising personal responsibility and flexibility in personal, workplace, and community contexts; setting and meeting high standards and goals for one's self and others; tolerating ambiguity

⁶ 21st century skills. (n.d.). Washington, DC: Partnership for 21st Century Skills.

• Social responsibility: Acting responsibly with the interests of the larger community in mind; demonstrating ethical behavior in personal, workplace, and community contexts

Appendix D: Rubrics

Group Participation Assessment Rubric

	Beginning	Developing	Accomplished	Exemplary	Score
	1 point	2 points	3 points	4 points	
Group	Rarely	Contributed	Contributed	Contributed	
Discussions	contributed to	good effort to	great effort to	exceptional	
	discussions	discussions of	discussions of	effort to	
	of the group	the group	the group	discussions of	
				the group	
On-task	Exhibited on-	Exhibited on-	Exhibited on-	Exhibited on-	
Behavior	task behavior	task behavior	task behavior	task behavior	
	inconsistently	some of the	most of the	consistently	
		time	time		
Helping	Did not assist	Seldom	Occasionally	Assisted other	
Others	other group	assisted other	assisted other	group	
	members	group	group	members	
		members	members		
Listening	Ignored ideas	Seldom	Occasionally	Always	
	of group	listened to	listened to	listened to	
	members	ideas of group	ideas of group	ideas of	
		members	members	group	
				members	

	Exemplary	Accomplished	Developing	Beginning	Score
	4 points	3 points	2 points	1 point	
Content	Clear thesis	Thesis and	Addresses	Does not	
	and focus	focus that	subject matter	focus on	
	that remains	remains	with minimal	topic	
	apparent	apparent	support		
Grammar	Correct and	Occasional	Problems in	Repeated	
	effective use	errors in use	use of	errors in use	
	of grammar	of grammar	grammar and	of grammar	
	and	and mechanics	mechanics	and	
	mechanics			mechanics	
Organization	Ideas flow	Logical order	Some	Lacks	
	smoothly	and	evidence of	organization	
	and	appropriate	an		
	logically	sequencing of	organizational		
	with clarity	ideas with	plan or		
	and	adequate	strategy		
	coherence	transition			

Written Report Assessment Rubric

Activity Performance Rubric

Student Name	Date
Student Hume	Date

Task to be performed______

	Possible Points	Points Awarded
Safety	25	
Personal safety (glasses, clothing, etc.)		
Safe use of tool		
Safely performs the task		
Performance of the Task	50	
Follows the task instructions		
Performs the task efficiently		
Performs the task satisfactorily		
Lab Maintenance	25	
Area clean-up (clean and tidy)		
Area organization (before, during, and after the task)		
Total	100	

Comments for deductions:

Presentation Checklist

____/16 Preparation

- _____/24 Thoroughness
- ——/19 Extra Materials

—/13 Actual Presentation

Preparation:

- 1. ____/2 Information written (neatly)
- 2. ____/2 Sources used listed
- ______/5 Worked every day (did not waste time) 3.
- 4. _____/5 Has all materials ready for use 5. _____/2 Cooperative

Organization

- 1. ____/2 Report in a logical order
- 2. ____/2 Interesting manner
- 3. /20 Notebook check
- 4. ____/2 Understanding of topic
- 5. ____/2 Spelling and sentence structure (do not copy from books)

Thoroughness

- 1. ____/5 Main points given
- 2. /5 Details to explain given
- 3. ____/5 Information presented clearly
- 4. ____/4 More than one source used
- 5. ____/5 Extra materials are appropriate

Extra Materials

- 1. ____/2 Neatness
- _____/7 Creativity $\frac{2}{2}$
- /2 Dramatic value 3.
- /3 Useful 4.
- 5.

Actual Presentation

- 1. ____/3 Speaks clearly and distinctly
- 2. ____/2 Uses extra materials effectively
- 3. ____/2 Posture
- 4. ____/2 Pronounces all words correctly
- 5. ____/2 Organized in thought
- 6.____/2 Rate

<u>____/100 Total points earned</u>

Lab Inquiry Rubric

Requirements	5 points	4 points	3 points	2 points	1 point	0 points
Lab Introduction	All parts of	All parts of	One part of	Parts of the	Parts of the	The total
(date, name, title,	the lab intro.	the lab intro.	the lab intro.	lab intro, are	lab intro. are	require
sequence, and	are present.	are present.	is missing.	missing, but	missing, and	ment is
clarity	and in	but not in	but in	the report is	the report is	missing
	sequence	sequence	sequence	in sequence	not in	8
	with clarity	and/or not	and/or not	with clarity	sequence	
		with clarity	with clarity		with clarity	
Hypothesis (if	The hypo.	The hypo, is	The hypo, is	The hypo, is	The hypo, is	The total
required) and	and	not clearly	clearly	clearly	not clearly	require
Procedures	procedures	defined. but	defined, and	defined. but	defined. and	ment is
written as part of	are written in	the	the	some	some of the	missing
the pre-lab	sequence and	procedures	procedures	procedures	procedures	moonig
discussion	clarity	are written in	are in	that are not in	are not in	
		sequence and	sequence but	sequence	sequence or	
		clarity	without	with some	clearly	
		enancy	clarity	clarity	defined	
Observation.	Well written	Well written	Most written	Some written	Few written	The total
Accuracy, and	observations	observations	observations	observations	observations	require
Data Collection	with data	with data	with data	without data	without data	ment is
Duiu Concetion	collection	collections	collections	collections	collections	missing
	and	and	presented but	but	and no	missing
	calculations	calculations	the	calculations	calculations	
	are clearly	are clearly	calculations	are correct	are correct	
	laid out and	laid out but	are not clearly	ure contect	ure conteet	
	correct	not correct	laid out but			
	contect	not concet	correct			
Conclusion to	The	Most of the	Some of the	Only a small	Only a small	The total
include a	conclusion	conclusion is	conclusion is	amount of the	amount of the	require
summarization of	completely	summarized	summarized	conclusion is	conclusion is	ment is
the lab data and	summarized	with	with most	summarized	summarized	missing
with logical	with all	guestions	auestions	with some of	with no	8
answered	questions	answered in a	answered in a	questions	questions	
auestions about	answered in a	logical	logical	being	being	
the hypo. or	logical	manner	manner	answered	answered.	
assignment	manner					
Presentation and	The lab	The lab	The lab report	The lab	The lab	The lab
Lab Safety Rules	report is	report is	is mostly	report is	report is	report is
	completely	mostly	correct: few	somewhat	completely	complete
	correct: no	correct: few	grammar or	correct: some	incorrect with	l v
	spelling or	grammar or	spelling	grammar or	a lot of	incorrect
	grammar	spelling	mistakes.	spelling	grammar	with a lot
	mistakes. No	mistakes. No	With a minor	mistakes. No	errors. No	of
	safety	safety	safety	safety	safety	grammar
	violations	violations	violation	violations	violations	errors with
						safety
						violations

Teacher comments:

Score: _____

	Excellent	Accomplished	Needs	Unsatisfactory
		•	Improvement	
	4 Points	3 Points	2 Points	1 Point
Comprehension	Shows complete	Asks for more	Shows partial	Resists attempts to
	understanding of	details to clarify	understanding of	get clarification
	the issues, and	understanding of	the issue but does	
	grasps	the issue	not ask for	
	implications		clarification	
	beyond the			
	immediate issue			
Strategizing	Develops realistic	Chooses	Shows evidence of	Needs assistance
~	strategies that	appropriate	strategy that may	to choose a
	would provide a	strategies that may	or may not satisfy	strategy
	satisfactory	satisfy		
	conclusion	-		
Innovation	Devises more	Offers a solution	Offers a solution	Shows some
	than one		with a limited	understanding of
	resolution to the		point of view	the problem
	problem		-	-
Communications	Convincingly	Explains solution	Conveys an	Unsure of how to
	communicates	so others can	opinion	explain
	resolution	understand	-	_

Case Study Assessment Rubric

Written Report Checklist

____/16 Preparation

- ____/28 Organization
- ____/24 Thoroughness
- ____/19 Extra Materials
- ____/13 Final Report

Preparation:

- 1. ____/2 Information written (neatly)
- 2. ____/2 Sources used listed
- 3. ____/5 Worked every day (did not waste time)
- 4. ____/5 Has all materials ready for use
- 5. ____/2 Cooperative

Organization

- 1. ____/2 Report in a logical order
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Thoroughness

- 1. ____/5 Main points given
- 2. ____/5 Details to explain given
- 3. ____/5 Information presented clearly
- 4. ____/4 More than one source used
- 5. ____/5 Extra materials are appropriate

Extra Materials

- 1. ____/2 Neatness
- 2. ____/7 Creativity
- 3. ____/2 Dramatic value
- 4.____/3_Useful
- 5. ____/5 Correctness

Final Report

- 1. ____/3 Written clearly
- 2. ____/2 Organized
- 3. ____/2 Sources documented correctly
- 4.____/2 Spelling
- 5.____/2 Grammar
- 6. ____/2 Neatness

____/100 Total points earned

Field Trip Participation Checklist

- <u>1. The student arrived at the designated meeting place on time with all materials and supplies required for the field trip.</u>
- <u>2</u> The student observed all safety rules and policies while traveling to and participating in the field trip.
- <u>3.</u> The student demonstrated interest in the content of the field trip by paying attention to the exhibits and speakers, asking pertinent questions, and taking notes.
- _____4. The student exhibited a positive attitude toward the events and activities of the field trip.
- <u>____5. The student remained on task throughout the field trip.</u>
- <u>6. The student exhibited cooperative workplace skills with other students throughout the field trip.</u>