

Exploring Agricultural Science

AGRICULTURAL EDUCATION | Career and Technical Education

6829

Summer 2011



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All materials in this guide may be reproduced for educational purposes only.

FOREWORD

This curriculum guide, Exploring Agricultural Science, was developed to assist teachers in preparing students to meet the North Carolina State Board of Education’s Guiding Mission “that every public school student will graduate from high school, globally competitive for work and postsecondary education and prepared for life in the 21st century.” The course is rigorous and relevant, is based on state and national content standards, and engages technology to teach today’s generation of students. Related business and industry partners have endorsed this course as one that helps to prepare students for high-skill, high-wage, and/or high-demand occupational opportunities.

This course is designed to enhance agricultural literacy for Middle Grades students and thus help students understand the impact of agriculture on society and their own lives. The course focuses on the production of food and fiber; with an emphasis on the stewardship of resources as well as the final utilization of agricultural products. Work-based learning strategies appropriate for this course are provided through supervised agricultural experiences and field trips. FFA leadership activities, meetings, conferences, and competitions provide opportunities for application of instructional competencies.

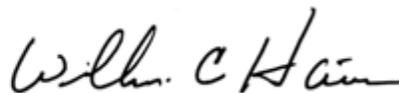
This guide contains instructional activities that enhance the core academic areas of reading, writing, and mathematics. It includes instructional support materials and performance assessments that are aligned to the course content. Formative assessments provide continuous feedback to measure student learning throughout the course. A companion classroom assessment bank — aligned, valid, and reliable — is available for your use after the first year of implementation and provides summative assessments for each objective.

The North Carolina Department of Public Instruction’s Career and Technical Education division developed this guide using two dimensions of *Revised Bloom’s Taxonomy* present in *A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom’s Taxonomy of Educational Objectives* (Addison Wesley Longman, Inc., 2001). We are grateful to the course developers for their work.

We trust these significant efforts will guide North Carolina’s teachers in their mission to prepare globally competitive students for a successful, 21st-century life.



June St. Clair Atkinson, Ed.D.
State Superintendent of Public Instruction
State



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Board of Education

INTERNET POLICY

Career and Technical Education curricula and 21st Century Skills require students to use many technologies, including the Internet. Each school should have an Internet use policy, and all students should sign the school Internet policy prior to beginning any class that uses such technologies. Students who violate the school's Internet policy must be held accountable for their actions and face appropriate consequences deemed necessary at the school in accordance with the school's policies.

Teachers must use extreme caution when assigning Internet activities to students. Teachers must preview sites, which can change daily, prior to ANY activity. If the teacher determines that a website used in an activity is inappropriate, or that students are not mature enough to behave properly and according to the school's Internet policy, the teacher should make alternate arrangements for completing the activity.

ACKNOWLEDGEMENTS

This course is a compilation of materials that have been developed by the National FFA Organization with the cooperation of business/industry leaders and the input of agriculture science teachers at the national level. The main components of this course are taken directly from the on-line course developed by National FFA entitled “Middle School Food and Agricultural Literacy”. One may review the individual lesson plans to obtain further credit information.

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GOING GREEN: A GUIDE TO USING CTE CURRICULUM FOR ENVIRONMENTAL SUSTAINABILITY

Many of the Instructional Support Materials (ISMs) are developed to help students organize and use the unpacked content relative to the designated Revised Bloom's Taxonomy (RBT) verb. These are designed to help students study and retain relevant information.

Ideally, each ISM would be duplicated and handed to students in class. Realistically, teachers may have to find alternative approaches for implementing the ISMs in the classroom.

Teachers may have to "show" what each ISM looks like and rely on students drawing each in either a journal or on paper that is accumulated in a notebook.

Consider these alternative approaches for using the Instructional Support Materials in the classroom:

- Draw the ISM on the board.
- Duplicate the ISM and hand out one per group and collect at the end of class for use in another. To add longevity, consider laminating or using sleeve protectors for each ISM.
- Laminate and have students use dry-erase marker pens if they need to write on the ISM. An alternative would be to place the ISM in a sleeve protector and have the students use dry-erase marker pens.
- Prepare a transparency of the ISM and show it on an overhead projector.
- Display the file in electronic form (PowerPoint or Word) through a digital projector.
- Display the file in electronic form on an interactive whiteboard.
- Display the file in electronic form via a document camera and digital projector.
- Deliver the file electronically via an internal network, Blackboard, Moodle, or secure website. This would provide added benefit to homebound and absent students needing to make up work.

Other helpful conservation hints...

- Always use both sides of the paper!!
- If a student needs to redo an assignment, whenever possible, have the student use a different color pen or pencil and work on the same paper.

We hope these ideas will help conserve paper and other valuable resources!

Exploring Agricultural Science

Course Number: 6829

Recommended Maximum Enrollment: 25

Hours of Instruction: 135 (block) 150 (regular)

Prerequisite: None

This middle school course introduces students to the industry of agriculture. Topics of instruction include animal science, agricultural science and technology, plant science, agricultural issues, natural resources, food science, stewardship, consumer agriculture, and careers in agricultural science. English language arts, mathematics and science are reinforced in this course. Work-based learning strategies appropriate for this course are mentorship, school-based enterprise, service learning, job shadowing and supervised agricultural experience. FFA competitive events, community service, and leadership activities provide the opportunity to apply essential standards and workplace readiness skills through authentic experiences.

OVERVIEW OF CAREER AND TECHNICAL STUDENT ORGANIZATIONS (CTSO)

Introduction

Career and Technical Student Organizations provide the opportunity for students to connect to business and industry professionals and career options. Additionally, CTSOs motivate students to higher level academic achievement and build interpersonal and employability skills. CTSOs are co-curricular, meaning they complement the state curricula in the classroom and incorporate realistic educational experiences not available through classroom instruction alone. Teachers must coordinate with local CTE directors to enhance the delivery of state curricula through CTSO activities. Through this coordinated effort, teachers improve student achievement on state and national Career and Technical Education (CTE) accountability measures. The Carl D. Perkins Career and Technical Education Act of 2006 allows CTE directors to fund certain CTSO activities as identified in the 2009 NC CTE Fiscal and Policy Guide.

What are CTSOs?

The three components of a quality Career and Technical Education program include classroom instruction, workforce readiness and on-the-job training, and Career and Technical Student Organizations. CTSOs have been a part of Career and Technical Education since the passage of the Smith-Hughes Act of 1917. CTSOs are found in middle and high schools and post-secondary institutions throughout the nation and around the world. It is important to realize that CTSOs are not just “clubs”, but instructional tools that work best when integrated into the curricula. CTSOs:

- Support and enhance related school-based and work-based learning,
- Provide students with skills and knowledge to succeed in the new global economy,
- Provide career exploration and competence,
- Provide students with the opportunity to experience competition related to classroom instruction,
- Encourage students to experience community service projects, and
- Provide and enhance the development of leadership skills in students.

Carl D. Perkins Career and Technical Education Act of 2006 Defined

“The Carl D. Perkins Career and Technical Education Act of 2006 (Public Law 109-270) is the vehicle through which federal support is distributed to states, local school districts, and postsecondary institutions to develop more fully the academic and technical skills of secondary and postsecondary students who elect to enroll in career and technical education programs.” (*Source: CTSO Guide to accessing Federal Perkins Funds, 2008*)

What are the benefits of CTSOs?

- Develop meaningful business partnerships
- Develop school and community leaders
- Enable students to achieve high academic and occupational standards
- Enhance student self-esteem and self-confidence
- Help students to integrate contextual and academic learning
- Link school-based learning to the real world of work and family
- Motivate youth to become better students and productive citizens

FFA

The FFA is a national organization of Agricultural Education students. FFA makes a positive difference in the lives of students by developing their potential for premier leadership, personal growth and career success through agricultural education. The opportunities that are available for FFA members include:

- Career Development Events – FFA members earn recognition by utilizing their classroom and laboratory knowledge in team and individual events.
- Degree Programs – FFA members advance in the organization by meeting rigorous standards to obtain degrees.
- Proficiency Awards – Members are recognized for success in their respective Supervised Agricultural Experience Program.
- Scholarships – FFA awards students over two million dollars annually in college scholarships.
- Personal Growth Conferences – Teamwork and personal growth conferences are held each summer at the North Carolina FFA Center.
- Leadership Conferences and Conventions – FFA conducts events throughout the year that promote premier leadership, personal growth and career success.
- Service Activities – Students are engaged in numerous projects and activities to serve communities throughout North Carolina.

For more information on FFA opportunities, visit the following web sites.

North Carolina FFA Web Site: www.ncffa.org

National FFA Web Site: www.ffa.org

Exploring Agriscience - Course 6829
Agriculture Education
Equipment and Materials List

The list is a guideline to equip a program to meet the needs of a class of 24 students. Multiple classes may use the same materials, except where noted one per student in the program.

Classroom/Lab with Tables for 24 students
Computers - minimum of 1 per 3 students with internet access
Copier
Dry Erase Board – 2 per facility
Hotplate
LCD projector – 1 per facility
Overhead Projector
pH Test Kit - 4 per facility
Smartboard – 1 per facility
Thermometer
Transparency making materials
Fire Extinguisher – 1 per facility
First Aid Kit – 1 per facility
Optional - Greenhouse – minimum size should be 12' x 16'
Plant growth carts with lights – 2 per facility

The following supply list is not intended to be all inclusive. However, this list is a guide for getting the program started.

Colored pencils – 12 dozen
Dry Erase Markers (multiple colors) – 4 dozen
FFA Manuals – one per student for each year
FFA Student Handbooks – one per student
Flip Charts – 6 per facility
Flip Chart replacements – 2 dozen
Glue sticks – 4 dozen
Markers (several colors) – 4 dozen
Masking tape – 4 dozen
Poster board – 100 sheets
Scissors – minimum of 1 per 2 students
Scotch tape – 4 dozen
Post-it-notes – 12 dozen

The Equipment and Facilities Guide for Agricultural Education, Career and Technical Education is also located at <http://www.ncpublicschools.org/cte>

THE ADAPTED CTE COURSE BLUEPRINT OF ESSENTIAL STANDARDS

What is the Adapted CTE Course Blueprint of Essential Standards?

The Adapted CTE Course Blueprint of Essential Standards document contains the essential standards that are most important for a student to learn to be successful. Each essential standard is divided into indicators to help the teacher further determine subsets of information key to reaching the intended outcome.

Essential standards are big, powerful ideas that are necessary and essential for students to know to be successful in a course. Essential standards identify the appropriate verb and cognitive process intended for the student to accomplish. Essential standards provide value throughout a student's career, in other courses, and translate to the next level of education or world of work.

What are the components of the Adapted CTE Course Blueprint of Essential Standards?

Each Adapted CTE Course Blueprint of Essential Standards contains:

- Specific information describing the reason for using the Adapted CTE Course Blueprint of Essential Standards,
- Units of instruction,
- Numbered essential standards with the unique course identifier,
- Numbered indicators with the unique course identifier,
- Course weight showing the relative importance and percentage of total class time of each unit, and essential standard, and the
- Designation of each essential standard using the RBT category process verb (remember, understand, apply, etc.) of the outcome behavior.

What is the purpose of the Adapted CTE Course Blueprint of Essential Standards?

In North Carolina CTE, the Adapted CTE Course Blueprint of Essential Standards is primarily used, instead of a CTE Course Blueprint of Essential Standards, when the standards are written by industry or for a specific credential. Indicators on the Adapted CTE Course Blueprint of Essential Standards reflect the wording from business and industry and do not necessarily meet the standards of a CTE Course Blueprint of Essential Standards written using the Revised Bloom's Taxonomy (RBT).

There may be instances where the standards of a CTE Course Blueprint of Essential Standards cannot be met and the Adapted CTE Course Blueprint of Essential Standards is appropriate. For example, a course that combines information from several vendor products might be best written using the Adapted CTE Course Blueprint of Essential Standards. Additionally, many program areas affiliate with national consortiums that provide materials based on national standards and performance indicators that are incorporated using the Adapted CTE Course Blueprint of Essential Standards.

How is a course with an Adapted CTE Course Blueprint of Essential Standards assessed?

Assessment for courses developed using the Adapted CTE Course Blueprint of Essential Standards is written at the level of the **ESSENTIAL STANDARD** using one RBT category verb (remember, understand, apply, analyze, evaluate) that reflects the intended outcome of the sum of its indicators.

THE ADAPTED CTE COURSE BLUEPRINT OF ESSENTIAL STANDARDS

For example, the indicators copied from an industry credential for an essential standard may use an immeasurable verb or may use a verb that is misaligned with the true intent of the indicator. Those verbs would still be used, since they come from the credential, but the assessment items would not necessarily reflect the definition of that verb. However, NC CTE will review the items and ensure alignment cognitively at the essential standard level.

How does the Adapted CTE Course Blueprint of Essential Standards compare to a CTE Course Blueprint of Essential Standards?

Both the Adapted CTE Course Blueprint of Essential Standards and the CTE Course Blueprint of Essential Standards:

- Provide the framework of the curriculum for a given course.
- Include units of instruction and relative weights for each.
- Include the intended cognitive level students must achieve for success
- Provide teachers a plan for curriculum delivery for the year, assist in the preparation of daily lesson plans, and construct valid formative, benchmark, and summative assessments.

The Adapted CTE Course Blueprint of Essential Standards and CTE Course Blueprint of Essential Standards differ in that:

- The Adapted CTE Course Blueprint of Essential Standards contains essential standards, whereas the CTE Course Blueprint of Essential Standards contains competencies.
- The Adapted CTE Course Blueprint of Essential Standards contains indicators, whereas the CTE Course Blueprint of Essential Standards contains fully aligned objectives.
- Assessment occurs at the essential standards level on the Adapted CTE Course Blueprint of Essential Standards, whereas assessment occurs at the objective level on the CTE Course Blueprint of Essential Standards.

**Career and Technical Education
Adapted CTE Course Blueprint
of
Essential Standards**

Agricultural Education

6829 Exploring Agricultural Science

Public Schools of North Carolina
State Board of Education • Department of Public Instruction
Academic Services and Instructional Support
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Summer 2011

Contact <mailto:agedcourses@ncsu.edu> for more information.

This Adapted CTE Course Blueprint from the National FFA course “Middle School Food and Agricultural Literacy Curriculum” has been reviewed by business and industry representatives for technical content and appropriateness for the industry.

Adapted CTE Course Blueprint of Essential Standards

Essential standards are big, powerful ideas that are necessary and essential for students to know to be successful in a course. Essential standards identify the appropriate verb and cognitive process intended for the student to accomplish. Essential standards provide value throughout a student's career in other courses and translate to the next level of education or world of work.

The essential standards use Revised Bloom's Taxonomy (RBT) category verbs (remember, understand, apply, analyze, evaluate, create) that reflect the overall intended cognitive outcome for the course. Each essential standard and indicator reflects the intended level of learning through two dimensions; The Knowledge Dimension is represented with letters A-C and the Cognitive Process Dimension by numbers 1-6.

The Adapted CTE Course Blueprint includes units of instruction, essential standard(s) for each unit, and the specific indicators to direct learning. Also included are the relative weights of the units and essential standards within the course.

This document will help teachers plan for curriculum delivery for the year, prepare daily lesson plans, and construct valid formative, benchmark, and summative assessments. Assessment for this course is written at the level of the **ESSENTIAL STANDARD** and assesses the intended outcome of the sum of its indicators.

For additional information about this blueprint, contact the Department of Agricultural and Extension Education, North Carolina State University, Box 7654, Raleigh, NC 27695-7654

Reference: Anderson, Lorin W. (Ed.), Krathwohl, David R. (Ed.), et al., *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, Addison Wesley Longman, Inc., New York, 2001.

Interpretation of Columns on the NCDPI Adapted CTE Course Blueprint

No.	1	2	3	4
Heading	Essential Std #	Unit Titles, Essential Standards, and Indicators	Course Weight	RBT Designation
Column information	Unique course identifier and essential standard number.	Statements of unit titles, essential standards per unit, and specific indicators per essential standard. If applicable, includes % for each indicator.	Shows the relative importance of each unit and essential standard. Course weight is used to help determine the percentage of total class time to be spent on each essential standard.	Classification of outcome behavior in essential standards and indicators in Dimensions according to the Revised Bloom's Taxonomy. Cognitive Process Dimension: 1 Remember 2 Understand 3 Apply 4 Analyze 5 Evaluate 6 Create Knowledge Dimension: A Factual Knowledge B Conceptual Knowledge C Procedural Knowledge

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Career and Technical Student Organizations (CTSO) are an integral part of this curriculum. CTOS are strategies used to teach course content, develop leadership, citizenship, responsibility, and proficiencies related to workplace needs.

Adapted CTE Course Blueprint of Essential Standards for 6829 Exploring Agricultural Science

(Recommended hours of instruction: 67 block schedule, 90 semester schedule)

Essential Std #	Units, Essential Standards, and Indicators (The Learner will be able to:)	Course Weight	RBT Designation
1	2	3	4
	Total Course Weight	100%	
A	Introduction to Agricultural Science	22%	
1.00	Apply fundamentals of the agricultural science program.	10%	C3
	1.01 Remember the basics of an agricultural science program. (6%) 1.02 Implement foundational and life skills learned through agriculture in the school and community setting. (4%)		
2.00	Understand the Importance of Agriculture to our social and economic well-being.	12%	B2
	2.01 Interpret how agriculture supports life and how advances in the industry have helped society. (6%) 2.02 Understand skills and careers in the agricultural science industry. (6%)		
B	Agriculture and the Environment	40%	
3.00	Understand the relationship between natural resources and the production of food and fiber.	12%	B2
	3.01 Explain the importance of natural resources in the agricultural industry. (8%) 3.02 Understand the role of alternative energy as it relates to the agricultural industry. (4%)		
4.00	Understand how environmental stewardship within the agricultural industry relates to natural resource stewardship.	8%	B2
	4.01 Explain the environmental impact of plant and animal production. (5%) 4.02 Exemplify strategies for effectively using resources in the agricultural industry. (3%)		
5.00	Understand the fundamentals of the animal science industry.	12%	B2
	5.01 Recognize terminology of common production systems used in the animal science industry. (6%) 5.02 Understand the importance of animal product uses and consumer product awareness. (3%) 5.03 Understand responsible animal welfare and care practices and the environmental impacts related to animal production. (3%)		
6.00	Understand the fundamentals of the plant science industry.	8%	B2
	6.01 Understand basic plant physiology. (4%) 6.02 Exemplify the uses of plants and plant products. (4%)		
C	Modern Agricultural Practices for Safe Food and Fiber	38%	
7.00	Understand the importance of food and agricultural product processes.	15%	B2
	7.01 Understand agribusiness, government, and the consumer role in providing safe agricultural products for consumption. (5%) 7.02 Understand processes involved in converting agricultural products to food and fiber products. (5%) 7.03 Understand marketing and labeling principles that help consumers. (5%)		
8.00	Understand the role of science and technology in the agricultural industry.	11%	B2
	8.01 Understand the role of research in the agricultural industry. (5%) 8.02 Understand concepts and issues related to biotechnology and other emerging technologies in the agricultural industry. (6%)		

Essential Std #	Units, Essential Standards, and Indicators (The Learner will be able to:)	Course Weight	RBT Designation
1	2	3	4
9.00	Understand the current issues impacting the agricultural industry.	12%	B2
	9.01 Recognize issues impacting the agricultural industry. (6%) 9.02 Explain the economic impact of agriculture issues and the role advocacy. (3%) 9.03 Understand animal welfare and animal rights in production and showing of animals. (3%)		

Exploring Agricultural Science Instructors Guide

INTRODUCTION: This course has been developed to meet an ever growing need to educate children about the fundamentals of the agricultural industry from the production of the food and fiber for survival to the utilization of value added products for the consumer. Emphasis for this course is to relate the agricultural industry to the natural resources and environment in which it operates.

METHODOLOGY: This course uses the materials developed and available from National FFA. Teachers who desire to teach this course should have access to the ffa.learn.com website and follow these simple steps.

1. Once at the website teacher will register using an ID along with a password of their choice to access the course outlines.
2. Access the materials for the course by clicking on the Teachers/Advisors button. Two disciplines will be needed for this course:

2.1. [The Official FFA Student Handbook Advisor's Guide\(SHAG\)](#)

- 2.1.1. <https://ffa.learn.com/learncenter.asp?sessionid=3-E16627B6-D043-460D-9DFD-D4E11798D64E&DCT=1&id=178409&page=87>
- 2.1.2. Unit 1 “FFA Basics” with Lessons 1.1 through 1.9 and Unit 2 “FFA History” with Lessons 2.1 through 2.3 should be the minimum standard.
- 2.1.3. Elements from units 3 through 6 may be added as time permits

2.2. [Middle School Food and Agricultural Literacy Curriculum](#)

- 2.2.1. <https://ffa.learn.com/learncenter.asp?sessionid=3-E16627B6-D043-460D-9DFD-D4E11798D64E&page=47>
- 2.2.2. The curriculum is broken down into Key Concepts or Units with the first one being “Introduction to Animal Science”.
- 2.2.3. Within each are lessons that subdivided into broad areas. For example, the unit “Introduction to Animal Science” has 28 lessons subdivided into 8 areas.

3. A Blueprint and Instruction Outline will be used to incorporate the materials into a North Carolina format.
 - 3.1. The Blueprint will contain Units, Essential Standards, and Indicators along with an RBT designation. To facilitate the blueprint, the materials from the web-based instruction may be grouped differently.
 - 3.2. The Instructional Outline will contain a list of Lessons for each Indicator found in the blueprint.
4. Each lesson will be identified by discipline, unit, and Lesson. Lessons may be adapted for the use of each individual program to utilize time most wisely.
 - 4.1. Some programs will operate on a shorter schedule than others and will have to select the units from each discipline to include in the instruction.
 - 4.2. Both disciplines should be used if the class is taught.

Adapted CTE Course Instructional Outline for 6829 Exploring Agricultural Science

(Recommended hours of instruction: 67 block schedule, 90 semester schedule)

Essential Std #	Units, Essential Standards, and Indicators (The Learner will be able to:)	Discipline per Blueprint Unit	Lessons per Indicator
		Lesson Unit per Blueprint Indicator	
A	Introduction to Agricultural Science	The Official FFA Student Handbook Advisor’s Guide and (SHAG)	
		Middle School Food and Agricultural Literacy Curriculum	
1.00	Apply fundamentals of the agricultural science program.		
	1.01 Remember the basics of an agricultural science program. (6%)	Unit 1 “FFA Basics” Unit 2 “FFA History” Unit 4 “FFA Programs”	SHAG Lessons 1.1 – 1.9; SHAG Lessons 2.1 – 2.3; SHAG Lessons 4.4 - 4.7
		Unit: Introduction to Agricultural Science <i>Areas: Human Safety, Defining Agriculture, and Agricultural Perceptions</i>	Lessons 1.1 – 1.2; Lesson 2.2; Lessons 5.1 – 5.3
	1.02 Implement foundational and life skills learned through agriculture in the school and community setting. (4)%	Unit: Introduction to Agricultural Science <i>Area: Foundational/Life Skills</i>	Lessons 3.1 - 3.6
		Unit: Introduction to Agricultural Science <i>Area: Stewardship</i>	Lesson 7.1
2.00	Understand the Importance of Agriculture to our social and economic well-being.		
	2.01 Interpret how agriculture supports life and how advances in the industry have helped society. (6%)	Unit: Introduction to Agricultural Science <i>Areas: Defining Agriculture, Agriculture Products, Overview</i>	Lesson 2.1; Lessons 4.1 – 4.2; Lesson 8.1
		Unit: Introduction to Agricultural Science <i>Areas: Defining Agriculture, Overview</i>	Lesson 2.4; Lesson 8.5; Lesson 2.3 to be placed where teacher feels it works best
		Unit: Agricultural Science and Technology <i>Area: History of Ag Innovations</i>	Lessons 1.1 - 1.2 Use with 8.5 above
	2.02 Understand skills and careers in the agricultural science industry. (6%)	Unit: Introduction to Agricultural Science <i>Areas: Overview</i>	Lesson 8.7
		Unit: Careers in Agricultural Science <i>Area: Career Exploration</i>	Lessons 1.1 – 1.11

Essential Std #	Units, Essential Standards, and Indicators (The Learner will be able to:)	Discipline per Blueprint Unit	Lessons per Indicator
		Lesson Unit per Blueprint Indicator	
B	Agriculture and the Environment	Middle School Food and Agricultural Literacy Curriculum	
3.00	Understand the relationship between natural resources and the production of food and fiber.		
	3.01 Explain the importance of natural resources in the agricultural industry. (8%)	Unit: Introduction to Agricultural Science <i>Areas: Overview</i>	Lesson 8.4
		Unit: Natural Resources <i>Areas: Renewable vs. Non-renewable, Air, Water, Soil, and Forestry</i>	Lessons 1.1 – 1.2; Lesson 2.1 Lessons 3.1 – 3.4 Lessons 4.1 – 4.4 Lessons 5.1 – 5.4
	3.02 Understand the role of alternative energy as it relates to the agricultural industry. (4%)	Unit: Natural Resources <i>Areas: Alternative Energy</i>	Lessons 6.1 – 6.5
4.00	Understand how environmental stewardship within the agricultural industry relates to natural resource stewardship.		
	4.01 Explain the environmental impact of plant and animal production. (5%)	Unit: Introduction to Agricultural Science <i>Areas: Stewardship</i>	Lesson 7.2
		Unit: Animal Science <i>Areas: Environmental Sustainability</i>	Lessons 6.1 – 6.3
		Unit: Plant Science <i>Areas: Environmental Impact</i>	Lessons 4.1 – 4.2
	4.02 Exemplify strategies for effectively using resources in the agricultural industry. (3%)	Unit: Natural Resources <i>Areas: Natural Resource Stewardship</i>	Lessons 7.1 – 7.5
5.00	Understand the fundamentals of the animal science industry.		
	5.01 Recognize terminology of common production systems used in the animal science industry. (6%)	Unit: Animal Science <i>Areas: Terminology</i>	Lessons 1.1 – 1.2
		Unit: Animal Science <i>Areas: Production Systems</i>	Lessons 2.1 – 2.8
	5.02 Understand the importance of animal product uses and consumer product awareness. (3%)	Unit: Animal Science <i>Areas: By-Products</i>	Lessons 3.1 – 3.2
		Unit: Animal Science <i>Areas: Consumer Awareness</i>	Lessons 4.1 – 4.2
	5.03 Understand responsible animal welfare and care practices and the environmental impact related to animal production. (3%)	Unit: Animal Science <i>Areas: Animal Welfare and Care</i>	Lessons 5.1 – 5.4

Essential Std #	Units, Essential Standards, and Indicators (The Learner will be able to:)	Discipline per Blueprint Unit	Lessons per Indicator
		Lesson Unit per Blueprint Indicator	
6.00	Understand the fundamentals of the plant science industry.		
	6.01 Understand basic plant physiology. (4%)	Unit: Plant Science <i>Areas: Plant Science and Anatomy</i>	Lessons 1.1 – 1.3
	6.02 Exemplify the uses of plants and plant products. (4%)	Unit: Plant Science <i>Areas: Consumer Awareness</i>	Lessons 2.1 – 2.2
		Unit: Plant Science <i>Areas: Fiber</i>	Lessons 3.1 – 3.2
C	Modern Agricultural Practices for Safe Food and Fiber		
7.00	Understand the importance of food and agricultural product processes.		
	7.01 Understand agribusiness, government, and the consumer role in providing safe agricultural products for consumption. (5%)	Unit: Food Science <i>Areas: Consumer Awareness – Field to Fork</i>	Lessons 1.1 – 1.8
		Unit: Introduction to Agricultural Science <i>Areas: Consumer Knowledge</i>	Lessons 6.1 – 6.2
	7.02 Understand processes involved in converting agricultural products to food and fiber products. (5%)	Unit: Food Science <i>Areas: Processing Safety</i>	Lessons 2.1 – 2.8
	7.03 Understand marketing and labeling principles that help consumers. (5%)	Unit: Food Science <i>Areas: Production/Marketing</i>	Lessons 3.1 – 3.5
		Unit: Food Science <i>Areas: Food Nutrition and Labeling</i>	Lessons 4.1 – 4.5
8.00	Understand the role of science and technology in the agricultural industry.		
	8.01 Understand the role of research in the agricultural industry. (5%)	Unit: Agricultural Science and Technology <i>Areas: Research</i>	Lessons 2.1 – 2.9
	8.02 Understand concepts and issues related to biotechnology and other emerging technologies in the agricultural industry. (6%)	Unit: Agricultural Science and Technology <i>Areas: Biotechnology</i>	Lessons 3.1 – 3.2
		Unit: Agricultural Science and Technology <i>Areas: Emerging Technology</i>	Lessons 4.1 – 4.3
		Unit: Plant Science <i>Areas: Technology</i>	Lessons 5.1 – 5.3
9.00	Understand the current issues impacting the agricultural industry.		
	9.01 Recognize issues impacting the agricultural industry. (6%)	Unit: Introduction to Agricultural Science <i>Areas: Overview</i>	Lesson 8.6 Lessons 8.2 – 8.3
		Unit: Agricultural Issues <i>Areas: Evaluating Issues</i>	Lessons 1.1 – 1.6
	9.02 Explain the economic impact of agriculture issues and the role advocacy has in the agriculture. (3%)	Unit: Agricultural Issues <i>Areas: Economic Impacts</i>	Lessons 2.1 – 2.4
		Unit: Agricultural Issues <i>Areas: Agriculture Advocacy</i>	Lessons 3.1 – 3.2
	9.03 Understand animal welfare and animal rights in production and showing of animals. (3%)	Unit: Agricultural Issues <i>Areas: Animal Welfare vs. Rights</i>	Lessons 4.1 – 2.6