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# Agriculture, Food, & Natural Resources Curriculum Map

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School Year: 2023-2024  
School: Southern Cayuga Jr./ Sr. High School  
Program: Agricultural Sciences  
Teacher: Ms. Wasson

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## Course Rationale:

*The Agricultural, Food, and Natural Resources course (previously known as Animal & Plant Sciences) is intended to build on the foundation of the Introduction to Agriculture Sciences course. The course is structured to enable all students to have a variety of experiences that will provide an overview of the animal and plant industries. This course introduces students to the plants, resources, energy, and animals we use and consume due to agricultural technologies. Every lesson includes unique and engaging hands-on activities and projects encouraging student exploration of the agricultural value chain from industry to consumer. In addition, the curriculum includes fresh and personalized assessment tools with laboratories, games, and questioning exercises. Projects throughout the course prepare students for selecting exploratory SAE projects they can implement after completing the course.*

## Course Outline:

Title or Topics / Essential Questions	Content Skills (Activities to cover Essential Questions)	Major Assessments	Vocabulary	Time Frame
<b>Agriculture in the Past</b> <ul style="list-style-type: none"><li>• What was the survival rate for a hunter-gatherer society?</li><li>• Why did humans develop agricultural practices?</li><li>• How do plants today compare to older varieties?</li></ul>	<b>1.1 Hunt and Gather</b> <ul style="list-style-type: none"><li>• Simulate a hunter-gatherer society.</li></ul> <b>1.2 Plant Selection</b> <ul style="list-style-type: none"><li>• Compare and contrast vegetable varieties.</li><li>• Use production information to select vegetable seeds.</li></ul>		Agriculture, Agriculturist, Area, Consume, Crops, Crossbreed, Diversified agriculture, Economic, Efficient, Environment, Germinate, Heirloom, Hunter-gatherer, Hybrid, Limiting factor, Population, Records, Ripple effect, Seed varieties, Social, Species,	2-3 weeks



<ul style="list-style-type: none"> <li>How are soil and soilless media different?</li> <li>What is a healthy soil?</li> <li>How can we increase plant production while sustaining our resources?</li> <li>What do plants need to be healthy and productive?</li> <li>How are plants beneficial to people?</li> </ul>	<p>2.3 Veggie Transplant</p> <ul style="list-style-type: none"> <li>Prepare a media in a planter and transplant plants.</li> </ul> <p>2.4 Healthy Happy Plants</p> <ul style="list-style-type: none"> <li>Virtually grow crops using traditional and sustainable practices.</li> <li>Observe the effect of the 4Rs on plant growth.</li> </ul> <p>2.5 Eye for Design</p> <ul style="list-style-type: none"> <li>Construct a floral arrangement to enhance an indoor area.</li> </ul> <p>Unit 2 check for Understanding</p>	<p>2.5 Project Evaluation Rubric</p> <p>Quiz: Check for Understanding</p>	<p>Organic matter, Peat moss, Perlite, Proportion, Sand, Seed, Seedling, Silt, Soil, Soil texture, Soilless media, Triadic colors, Unity, Vermiculite, and Water-holding capacity</p>	
<p><b>Starting from the Ground Up</b></p> <ul style="list-style-type: none"> <li>What is soil?</li> <li>How are soils formed?</li> <li>What is in soil?</li> <li>What is parent material?</li> <li>What is soil porosity?</li> </ul>	<p>3.1 Separating the Pieces</p> <ul style="list-style-type: none"> <li>Evaluate particle size and organic matter in a soil sample.</li> </ul> <p>3.2 Extracting Air</p> <ul style="list-style-type: none"> <li>Investigate organic matter's effects on soil porosity and soil air holding capacity.</li> </ul> <p>3.3 Getting the Feel for Soil</p>		<p>Accumulation, Addition, Bedrock, Clay, Climate, Deposition, Erosion, Gravel, Ground cover, Irrigation, Leaching, Microorganism, Mineral, Mineral soil, Organic matter, Organism, Parent material, Porosity, Reduction, Rock, Sand, Silt, Soil, Soil compaction, Topography,</p>	<p>4-5 weeks</p>

<ul style="list-style-type: none"> <li>• What is the role of organic matter in soil porosity?</li> <li>• How do sand, silt, and clay differ?</li> <li>• What influences the formation of soil?</li> <li>• What is a soil profile?</li> <li>• What is important to know about soil layers?</li> <li>• What is soil erosion, and why is it important to understand?</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct tests to determine soil texture by feel.</li> </ul> <p>3.4 On Your Mark, Get Set, FLOW</p> <ul style="list-style-type: none"> <li>• Quantify soil permeability to understand the relationship between soil particle size and rate of water filtration.</li> </ul> <p>3.5 Profiling Soil</p> <ul style="list-style-type: none"> <li>• Determine each horizon's texture, structure, and color within a soil profile.</li> </ul> <p>3.6 Moving Earth</p> <ul style="list-style-type: none"> <li>• Observe how the slope of the land causes water to erode soil.</li> <li>• Observe soil erosion caused by water.</li> </ul> <p>Unit 3 Check for Understanding</p>	<p>3.4 Lab Evaluation</p> <p>3.6 Lab Evaluation</p> <p>Quiz: Check for Understanding</p>	<p>Transformation, Translocation, Valley, and Weathering</p>	
<p><b>Water World</b></p> <ul style="list-style-type: none"> <li>• What is the water cycle?</li> <li>• Where is water found?</li> <li>• How does water change form in the water cycle?</li> </ul>	<p>4.1 The Story of Water</p> <ul style="list-style-type: none"> <li>• Play a game to simulate the journey of a drop of water through the water cycle.</li> </ul>	<p>4.1 Project Evaluation Rubric</p>	<p>Aquatic, Aquifer, Atmosphere, Clarity, Condensation, Conductivity, Confluence, Contaminant, Dissolved</p>	<p>3-4 weeks</p>

<ul style="list-style-type: none"> <li>How does topography influence the flow of water?</li> <li>What is a watershed?</li> <li>What is pollution?</li> <li>What is point source pollution?</li> <li>What is nonpoint source pollution?</li> <li>How does the slope of the land affect the spread of contaminants?</li> <li>What indicators measure water quality?</li> <li>How are standards used to determine water quality for drinking water differ from those used to determine the water quality of streams?</li> </ul>	<ul style="list-style-type: none"> <li>Write and illustrate a story about a drop of water's journey through the water cycle.</li> </ul> <p>4.2 Running Water</p> <ul style="list-style-type: none"> <li>Model and observe the flow of water over a landform.</li> </ul> <p>4.3 Spreading Pollutants</p> <ul style="list-style-type: none"> <li>Determine the spread of pollution from point and nonpoint sources.</li> </ul> <p>4.4 Testing for Quality</p> <ul style="list-style-type: none"> <li>Evaluate water quality with sensors to quantify temperature, pH, turbidity, dissolved oxygen, and total dissolved solids.</li> </ul> <p>4.5 Drink This</p> <ul style="list-style-type: none"> <li>Design an experiment determining drinking water quality.</li> </ul> <p>Unit 4 Check for Understanding</p>	<p>4.3 Teamwork Evaluation Rubric</p> <p>4.5 Lab Evaluation Rubric</p> <p>Quiz: Check for Understanding</p>	<p>oxygen, Environmental Protection Agency (EPA), Evaporation, Freezing, Groundwater, Hardpan, Hydroelectric, Infiltration, Lake, Landform, Melting, Non-point source pollution, Peak, Percolation, Point source pollution, Pollution, Precipitation, Ridge, River, Runoff, Stream, Surface water, Total dissolved solids (TDS), Transpiration, Turbidity, Water, Water Quality Index, and Watershed</p>	
<b>Resources We Use</b>				2-3 weeks

<ul style="list-style-type: none"> <li>• What are the natural resources used for making my clothes?</li> <li>• What are the advantages and disadvantages of biodegradable plastics?</li> <li>• How are composite woods produced?</li> <li>• How does human activity impact resource availability?</li> <li>• What features should producers and gardeners consider when selecting a fertilizer?</li> </ul>	<p>5.1 Fibers to Fabrics</p> <ul style="list-style-type: none"> <li>• Identify characteristics of common animal and plant fibers.</li> </ul> <p>5.2 Agricultural Plastics</p> <ul style="list-style-type: none"> <li>• Produce biodegradable plastic from crops.</li> </ul> <p>5.3 Timber and Composite Wood</p> <ul style="list-style-type: none"> <li>• Identify the properties of wood and explain how consumers use them.</li> </ul> <p>5.4 Resource Availability</p> <ul style="list-style-type: none"> <li>• Evaluate the effect of human activity on natural resource availability.</li> </ul> <p>5.5 Fertilizer Selection</p> <ul style="list-style-type: none"> <li>• Use sustainable practices to reduce fertilizer runoff.</li> </ul> <p>Unit 5 Check for Understanding</p>	<p>5.5 Problem Solving Evaluation Rubric</p> <p>Check for Understanding</p>	<p>Biodegradable, Bioplastic, Byproduct, Cellulosic fibers, Composite wood, Fiber, Hardwood, Lumber, Nitrogen, NPK, Phosphorous, Plastic, Polylactic acid (PLA), Potassium, Protein-based fibers, Softwood, <b>and</b> Wood</p>	
<p><b>Resources We Recycle</b></p> <ul style="list-style-type: none"> <li>• How can you create a self-sustaining ecosystem within your garden?</li> </ul>	<p>6.1 Reduce, Reuse, Recycle</p> <ul style="list-style-type: none"> <li>• Compare recyclable natural resources.</li> </ul>		<p>Compost, Criteria, Constraints, Decompose, Decomposers, Freshwater, Groundwater,</p>	<p>2-3 weeks</p>

<ul style="list-style-type: none"> <li>• What everyday materials decompose to produce compost?</li> <li>• How can producers conserve water?</li> <li>• What types of soil media filter solids?</li> <li>• How are pollutants removed from water?</li> <li>• What can you do to reduce, reuse, and recycle at home?</li> <li>• How can manufacturers incorporate the three R's?</li> </ul>	<p>6.2 Getting Down with Brown</p> <ul style="list-style-type: none"> <li>• Construct and monitor a compost tower in a garden.</li> </ul> <p>6.3 Fresh is Vital</p> <ul style="list-style-type: none"> <li>• Virtually grow crops and implement water conservation practices.</li> <li>• Explore the influence of mulch on soil moisture and temperature.</li> </ul> <p>6.4 You Shall Not Pass</p> <ul style="list-style-type: none"> <li>• Design a system to filter polluted water.</li> </ul> <p>6.5 Recycle and Redesign</p> <ul style="list-style-type: none"> <li>• Design a prototype using sustainable practices.</li> </ul> <p>Unit 6 Check for Understanding</p>		<p>Infiltration, Invertebrates, Irrigation, Mulch, Pollution, Problem solving, Prototype, Recycle, Reduce, Reuse, Saltwater, Surface water, and Three R's</p> <p>6.4 Project Evaluation Rubric</p> <p>6.5 Problem Solving Evaluation Rubric</p> <p>Quiz: Check for Understanding</p>	
<p><b>Energy We Consume</b></p> <ul style="list-style-type: none"> <li>• How is agriculture involved in energy production?</li> <li>• Are all energy sources the same?</li> </ul>	<p>7.1 Solar S'mores</p> <ul style="list-style-type: none"> <li>• Design and construct a solar oven to cook s'mores.</li> </ul> <p>7.2 Heating Homes</p>	7.1 Project Evaluation Rubric	<p>Amylase, Biofuel, Biomass, British thermal unit (BTU), Butane (C<sub>4</sub>H<sub>10</sub>), Byproduct, Cellulase, Cellulose, Distillers grain, Enzyme, Ethanol (C<sub>2</sub>H<sub>5</sub>OH),</p>	2-3 weeks

<ul style="list-style-type: none"> <li>• What is the best energy source?</li> <li>• What is the source of the energy I use?</li> <li>• How do by-products increase the value of an agricultural crop?</li> <li>• Should crops be used for fuel?</li> </ul>	<ul style="list-style-type: none"> <li>• Compare energy from multiple sources.</li> </ul> <p>7.3 Exploring Ethanol</p> <ul style="list-style-type: none"> <li>• Produce ethanol from corn-based sources.</li> </ul> <p>7.4 Looking at Mash</p> <ul style="list-style-type: none"> <li>• Compare protein and energy content of grain and distillers grain.</li> </ul> <p>Unit 7 Checking for Understanding</p>	<p>Quiz: Check for Understanding</p>	<p>Ferment, Gasoline, Glucose (C<sub>6</sub>H<sub>12</sub>O<sub>6</sub>), Hydroelectric, Non-renewable resource, Photosynthesis, Renewable energy, Solar power, Wind power, and Yeast</p>	
<p><b>Living In Harmony</b></p> <ul style="list-style-type: none"> <li>• What is ecology?</li> <li>• What is the difference between a biome and an ecosystem?</li> <li>• How are producers and consumers different?</li> <li>• How is energy lost in transfers through the energy pyramid?</li> <li>• What is a food web?</li> </ul>	<p>8.1 Eat or Be Eaten</p> <ul style="list-style-type: none"> <li>• Simulate the flow of energy in an ecosystem.</li> </ul> <p>8.2 Ecosystem Exploration</p> <ul style="list-style-type: none"> <li>• Research an ecosystem.</li> <li>• Develop a model and poster depicting the ecosystem.</li> </ul> <p>8.3 Walk Across the Country</p> <ul style="list-style-type: none"> <li>• Record key points of ecosystems presented by classmates.</li> </ul>	<p>8.2 Project Evaluation Rubric</p> <p>8.3 Project Evaluation Rubric</p>	<p>Aquatic, Abiotic, Biome, Biotic, Carnivore, Consumer, Coniferous Forest, Deciduous Forest, Desert, Ecology, Ecosystem, Energy, Energy pyramid, Energy Unit (EU), Environment, Fauna, Flora, Food chain, Food web, Forest, Grassland, Herbivore, Interdependence, Metabolism, Omnivore, Photosynthesis, Producer, Taiga, Temperate zone, Trophic</p>	<p>3-4 weeks</p>



<ul style="list-style-type: none"> <li>• What are the environmental characteristics of an ecosystem?</li> <li>• How do humans influence organisms in an ecosystem?</li> <li>• How do ecosystems differ across the United States?</li> </ul>	Unit 8 Check for Understanding	Quiz: Check for Understanding	level, Tropical Forest, and Tundra	
<b>Animals We Care For</b> <ul style="list-style-type: none"> <li>• Why are animals needed for plant reproduction?</li> <li>• Why were some species domesticated before others?</li> <li>• What are the differences between visible and invisible traits?</li> <li>• How are large animals handled safely?</li> </ul>	9.1 The Pollinator <ul style="list-style-type: none"> <li>• Match pollinators with flowers they pollinate.</li> <li>• Pollinate cucumber flowers.</li> </ul> 9.2 Where Did You Come From? <ul style="list-style-type: none"> <li>• Compare precursor and modern domesticated animal species.</li> </ul> 9.3 Same but Different <ul style="list-style-type: none"> <li>• Compare breeds within a chosen species.</li> </ul> 9.4 Halt and Hold		Anther, Breed, Cedar chips, Disposition, Domesticate, Farmer's loop, Halter, Manger hitch, Offspring, Pet, Pine chips, Pollen, Pollination, Pollinator, Selective breeding, Species, Square knot, Stigma, and Straw	3-4 weeks

<ul style="list-style-type: none"> <li>• Why is knot tying an important skill when working with large animals?</li> <li>• How do you select the equipment needed to care for an animal?</li> <li>• What are a pet owner's responsibilities?</li> <li>• What is the purpose of animal bedding?</li> </ul>	<ul style="list-style-type: none"> <li>• Practice tying halters and knots for handling large animals.</li> <li>• Demonstrate how to hold different animal species.</li> </ul> <p>9.5 Equip Your Pet</p> <ul style="list-style-type: none"> <li>• Select equipment to care for a specific animal.</li> </ul> <p>9.6 Designed for Rest</p> <ul style="list-style-type: none"> <li>• Design and test bedding to keep an animal comfortable, warm, and dry.</li> </ul> <p>Unit 9 Check for Understanding</p>	<p>9.6 Project Evaluation Rubric</p> <p>Quiz: Check for Understanding</p>		
<p><b>Food We Eat</b></p> <ul style="list-style-type: none"> <li>• How is flour processed?</li> <li>• Why are there different flour types?</li> <li>• What is the best cleaning method for raw fruits and vegetables?</li> <li>• What are the components of a food nutrition label?</li> </ul>	<p>10.1 Bread or Cake?</p> <ul style="list-style-type: none"> <li>• Mill flour from wheat and evaluate protein differences across flour types.</li> </ul> <p>10.2 Squeaky Clean</p> <ul style="list-style-type: none"> <li>• Compare cleaning methods for fresh fruits and vegetables.</li> </ul> <p>10.3 Pick a Pickle</p> <ul style="list-style-type: none"> <li>• Evaluate different varieties of pickles.</li> </ul>	<p>10.3 Lab Evaluation Rubric</p>	<p>Baking, Brine, Carbohydrate, Fat, Flour, Food and Drug Administration (FDA), Microbes, Milling, Mineral, Nutrition label, Palatable, Pickling, Preference, Processing, Produce, Protein, Serving, Value-added product, Variety, Vitamin, and Wheat</p>	<p>4-5 weeks</p>

<ul style="list-style-type: none"> <li>How do our senses impact the palatability of food?</li> <li>How is food processed from a raw commodity into a commercial good?</li> </ul>	<p>10.4 Food Labels</p> <ul style="list-style-type: none"> <li>Develop a food label for a jar of pickles and identify major nutrients.</li> </ul> <p>10.5 Food Processing</p> <ul style="list-style-type: none"> <li>Process food products from raw commodities.</li> </ul> <p>Unit 10 Check for Understanding</p>	<p>10.5 Teamwork Evaluation Rubric</p> <p>Quiz: Check for Understanding</p>		
<p><b>Agriculture in My Future</b></p> <ul style="list-style-type: none"> <li>What is your career plan?</li> <li>How will agriculture be part of your future?</li> <li>What can you do to learn more about your agricultural interests?</li> <li>What careers are involved in providing you with food, fiber, and energy?</li> <li>How are commodities processed for consumption?</li> </ul>	<p>11.1 And Another Thing</p> <ul style="list-style-type: none"> <li>Produce a salve and create a leather key fob from animal byproducts.</li> </ul> <p>11.2 SAE and ME</p> <ul style="list-style-type: none"> <li>Use past course experiences to plan a potential SAE Project.</li> <li>Reflect on skills learned and safety procedures practiced.</li> </ul> <p>11.3 Field to Fork</p> <ul style="list-style-type: none"> <li>Explain how agricultural products follow the value chain from field to fork.</li> </ul>	<p>11.2 Project Evaluation Rubric</p> <p>11.3 Project Evaluation Rubric</p>	<p>Career, Commodity, Consumer, End product, Pre-Production, Research and Development (R&amp;D), Sales and service, Skill, Supervised Agricultural Experience (SAE), Supply chain, and Value chain</p>	<p>2-3 weeks</p>

	<ul style="list-style-type: none"> <li>● Prepare a salad, bread, butter, and ice cream to consume in class.</li> </ul>			
	SAE for ALL – Foundational Project	FINAL PROJECT		

**Standards:**

- [AFNR Common Career and Technical Core Content Standards](#)
- [Next Generation Science Standards](#)
- [Common Core Standards for High School Mathematics](#)
- [Common Core Standards for English Language Arts, Grades 9-10](#)

**References:**

Agriculture, Food and Natural Resources (AFNR) Career Cluster Content Standards. (2015). Retrieved from <https://thecouncil.ffa.org/afnr/>

Curriculum for Agricultural Science and Education. (2023). Retrieved from <https://www.case4learning.org/>