

BiG CURRICULUM TOPICS & STANDARDS

Activity	Topic	Subject	NGSS	AFNR Content Standards
What are Blue Foods?	Aquaponics & grant intro.	Ag; Econ; Science	<ul style="list-style-type: none"> Stnds: HS-LS2-7, HS-ETS1-1 Core: HS-LS2-7 	<ul style="list-style-type: none"> FPP.04.02 FPP.04.03
Let's Get Started	Aquaponic system set-up with goldfish and basil.	Ag; Science	<ul style="list-style-type: none"> Stnds: HS-LS2-5, HS-LS2-7, HS-ETS1-4 Core: HS-LS2-5 	<ul style="list-style-type: none"> CRP.11.01 & 12.01 ESS.01.02 & 03.04, & 03.05 FPP 01.02 & 02.01 & 02.02 NRS.03.01 & 04.03 PS.01.01 & 01.02 & 01.04 & 03.01 - 03.05 & 04.01
Comparing the Financial and Environmental Costs of Food Production	Food production supply chain intro.	Economics	<ul style="list-style-type: none"> Stnds: HS-ETS1-1 	<ul style="list-style-type: none"> ABS.01.01 & ABS.01.03 NRS.02.04 CRP.12.01
Why Flow Rates Matter	How pollution is affected by flow rates.	Engineering; Math	<ul style="list-style-type: none"> Stnds: HS-LS-6, HS-ETS1-4 Core: HS-LS2-4, HS-LS2-7, HS-LS2-5, HS-LS2-6 	<ul style="list-style-type: none"> ESS.01.02 ESS.03.02 ESS.03.03
Food Safety in the Kitchen	Safe food handling.	Food Science	None	None
Comparing the Nutritional Value of Different Foods	Value of reading food labels.	Food Science, Science	None	None
Plant and Fish Nutrition	Important nutrients for plants and animals.	Ag; Science	<ul style="list-style-type: none"> Stnds: HS-LS2-5 Core: HS-LS2-7, HS-LS2-7 	<ul style="list-style-type: none"> ESS.03.04
The Systems Approach to Aquaponics	Importance of a systems approach.	Engineering; Math	<ul style="list-style-type: none"> Stnds: HS-LS2-4, HS-LS-6, HS-ETS1-3 Core: HS-LS2-7 	<ul style="list-style-type: none"> CRP.11.01 CRP.12.01 (optional)
Wastewater Recycling	Reducing nutrients and contaminants in aquaponics systems.	Engineering; Math	<ul style="list-style-type: none"> Stnds: HS-LS2-5, HS-LS2-7 Core: HS-LS2-4, HS-LS2-5 	<ul style="list-style-type: none"> ESS.04.01 ESS.04.02
Water Quality and Aquaponics	Taking WQ measurements.	Engineering; Math; Science	<ul style="list-style-type: none"> Stnds: HS-ETS1-1 	<ul style="list-style-type: none"> ESS.01.02 ESS.02.02 ESS.03.03
Zero Waste, Grid Independent and Economically Viable System	What is it?	Economics; Science	<ul style="list-style-type: none"> Stnds: HS-LS-6, HS-LS2-7, HS-ETS1-3 	

AG STANDARDS

- ABS.01.01. Apply economic principles to plan and manage inputs and outputs in an AFNR business.
- ABS.01.03. Develop and apply skills to manage an AFNR business in an efficient, legal and ethical manner.
- CRP.11.01. Research, select and use new technologies, tools and applications to maximize productivity in the workplace and community.
- CRP.12.01. Contribute to team-oriented projects and builds consensus to accomplish results using cultural global competence in the workplace and community.
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- ESS.01.02. Properly utilize scientific instruments in environmental monitoring situations (e.g., laboratory equipment, environmental monitoring instruments, etc.).
- ESS.03.04. Apply microbiology principles to environmental sustainability systems.
- ESS.03.05. Apply ecology principles to environmental sustainability systems.
- ESS.04.01. Develop systems of sustainability management for all categories of solid waste in environmental sustainability systems.
- ESS.04.02. Sustainably manage solid waste in environmental service systems.
- FPP.01.02. Apply food safety and quality assurance procedures in the harvesting, handling and processing of food products.
- FPP.02.02. Apply principles of microbiology and chemistry to develop food products to provide a safe, wholesome, and nutritious food supply for local and global food systems.
- FPP.04.02. Evaluate the significance and implications of changes and trends in the food products and processing industry in the local and global food systems.
- FPP.04.03. Identify the purpose of industry organizations, groups and regulatory agencies that influence the local and global food systems.
- NRS.02.04. Examine and explain how economics affects the use of natural resources.
- NRS.03.01. Sustainably produce, harvest, process and use natural resource products.
- NRS.04.03. Prevent or manage introduction of ecologically harmful species in a particular region.
- PS.01.01. Determine the influence of environmental factors on plant growth.
- PS.01.02. Prepare and adjust growing media for use in plant systems.
- PS.01.04. Develop and implement a nutrient management and/or fertilizer plan for specific plants or crops.
- PS.03.01. Demonstrate plant propagation techniques in plant system activities.
- PS.03.02. Develop and implement a management plan for plant production.
- PS.03.04. Apply principles and practices of sustainable agriculture to plant production.
- PS.03.05. Harvest crops according to industry standards.
- PS.04.01. Evaluate, identify, and prepare plants to enhance an environment.

Ag students wishing to focus on Education, Communication and Leadership Career Pathway are encouraged to use one or more of the activities with younger students to meet the following performance indicators.

- ECL.02.01. Develop and deliver a workshop or lesson using a variety of methods and best practices in instruction and facilitation.
- ECL.02.02. Evaluate facilitation or presentation strategies that encourage appropriate social interactions, embrace diversity, promote equity and build a positive learning environment that is welcoming to all individuals.
- ECL.03.01. Identify the methods and characteristics of effective verbal, nonverbal, written and visual communication.
- ECL.04.01. Develop a communications plan that includes purpose, target audience, message, medium and outcome evaluation.
- ECL.04.02. Identify, apply and demonstrate communication skills and methods per the communications plan.



Next Generation Science Standards

Disciplinary Core Ideas and Sub Ideas

- HS-LS2-4. Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
- HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
- HS-LS2-6. Evaluate claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
- HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

Standards:

- HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
- HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.
- HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.
- HS-LS2-4. Use a mathematical representation to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
- HS-LS2-5. Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
- HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.
- HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.