

Course: Agricultural Science

Instructor: Carolyn Wright

Unit	Time Frame	Learning Target (s) / Objective (s)	Standard (s)	Vocabulary	Assessments
What is Ag?	September (~ 1 week)	Explain what agriculture is, Define commodity and identify the top 10 commodities produced in the U.S., Create a postcard illustrating agriculture in one of the 50 states, Identify facts and fictional statements about U.S and NY agriculture	CS.02.02, CS.06.01, CS.06.02, FPP.04.01, HS-ETS1-3	Agriculture, Commodity	USA Postcard Project, Classroom discussion/debrief
FFA & Leadership	September (~ 2.5 weeks)	Identify and describe different types of leadership styles, Explain the FFA's mission and motto, List different types of CDE's, Identify the 5 elements of the FFA emblem and explain their relevance to the organization, Explain the changes made to the FFA Creed and why	CRP.01.01, CDOS1, CDOS2	Mission, Motto, Emblem, Creed, Premier Leadership, Personal Growth, Career Success	Famous FFA Members, The 5 W's and H of FFA, FFA Choice Board, FFA Mission Descriptors Activity w/ discussion, FFA Motto Comic Strip, Elements of the FFA Emblem Cut Apart Activity, FFA Creed- Old v. New

Ag Careers	October (~ 1 week)	Define SAE, Identify and Explain the different types of SAEs, Describe the advantage of an SAE	CS.05, CDOS1, CDOS2	Supervised Agriculture Experience (SAE), Exploratory, Placement/Internship, Ownership/Entrepreneurship, Research, School-based enterprise, Service Learning	SAE Note Sheet, SAE Idea Card Activity, Careers in Ag Project
Composting	October (~ 3 weeks)	<ul style="list-style-type: none"> • Identify different types of composting systems. • Explain the benefits and drawbacks of each type of composting system. • Evaluate an existing composting system (quality of compost produced, time to completion, ease of use, etc.) • Create a compost system for GVCS based on data/research collected. 		Composting, Food Waste, Aerobic, Anaerobic, Aeration, Biodegradability, Bulking agent, Contaminant, Curing, Decomposition, Humus, Inorganic, Leachate, Mature compost, Moisture content, Organic, Source separation, Stability	Classroom discussion on composting system benefits and drawbacks, ASC Compost System Evaluation (including test of compost), GVCS Food Waste Activity, GVCS Composting System Recommendation Presentation, Ethical Reflection - should we compost why or why not

Plant Science	October/November (~ 4 weeks)	Identify the difference between monocots and dicots; Explain how monocots and dicots differ; Identify the parts of a seed and flower; Explain the importance of bees in pollination; Identify and describe the different parts of a plant; Explain the difference between asexual and sexual reproduction in plants; Describe the proper technique for grafting; Explain the basic plant needs; Describe the processes of photosynthesis and respiration in plants	PS.02, PS.02.02, PS.02.03, NRS.01.02.01.b, HS-LS1-4, HS-LS1-5, HS-LS1-2, HS-LS1-3, PS.03, PS.03.01	Tropism, Monocots, Dicots, Photosynthesis, Germination, Seeds, Roots, Stems, Xylem, Phloem, Herbaceous, Woody, Leaves, Flowers, Asexual Reproduction, Sexual Reproduction, Pollination, Grafting, Genetics, Respiration	Edible Plant Parts Notes, Seed Dissection, Germination Experiment, Parts of a Plant Activity, Flower Dissection, Monocot/Dicot Lab, Floral Design Project, Grafting Lab, Pollination (Bee Activity), Plant Genetics Lab
Hydroponics	December (~ 1 week)	Explain what hydroponics is, Identify and Describe different types of hydroponics systems, Define growing media and identify different types used in hydroponics, Create a management plan for GVCS's existing systems	PS.01.02	Hydroponics, Growing Media, Closed system, Damping off, Deep water culture, Ebb and Flow, Flushing, Germination, Leachate, Macronutrients, Micronutrients, NPK ratio, Nutrient Solution, PPM, PH, Photoperiod, Reservoir, Rock wool, NFT, Total Dissolved Solids, Coir	Hydroponic note sheet, Hydroponics Advantages and Disadvantages, Hydroponic Management planning guide

Soil Science	December (~ 2 weeks)	<p>Identify the functions of soil; Identify and define the components of soil; Explain how soil forms; Identify and explain soil horizons; Describe soil's physical characteristics; Demonstrate proper soil sampling techniques,; Demonstrate how to texture soil by feel; Describe how we evaluate soils and land for agricultural and other uses; Explain ways that soil degrades in the environment</p>	<p>NRS.01.02, HS-ESS3-2, CCSS.ELA-Literacy.RST.11-12.1, CCSS.ELA-Literacy.RST.11-12.7, CCSS.ELA-Literacy.RST.11-12.8, CCSS.ELA-Literacy.WHST.9-10.2, CCSS.ELA-Literacy.WHST.11-12.2, CCSS.ELA-Literacy.WHST.9-10.7, CCSS.ELA-Literacy.WHST.11-12.7, CCSS.ELA-Literacy.WHST.9-10.9, CCSS.ELA-Literacy.WHST.11-12.9, CCSS.MATH.CONTENT.HSN-Q.A.1, CCSS.MATH.CONTENT.HSN-Q.A.2</p>	<p>Acidic soil, Aeration, A-horizon, Alkaline soil, B-horizon, Cation Exchange Capacity (CEC), C-horizon (substratum), Glacial Till, Humus, Land capability classification (LCC), Limiting layer, Micronutrient, Minor/trace elements, Neutral Soil, Nonmineral nutrients, O-horizon, Organic soil, Parent Material, Ped, Percolation, pH, Primary macronutrient, R-horizon, Saturation, Secondary Macronutrient, Soil, Soil Classification, Soil Horizon, Soil Infiltration, Soil Profile, Soil Structure, Soil Survey, Soil Texture, Topsoil, Weathering, Erodibility Index (EI), Erodibility of soils, Eutrophication,</p>	<p>Soil Horizons Activity, Soil Texture/Color Activity, Soil Leaching Activity, Web Soil Survey Activity, Soil Testing Lab (pH, etc.), Soil Profile Lab</p>
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Horticulture/Agronomy	January (~ 4 weeks)	<p>Explain the difference between horticulture and agronomy; Discuss how compaction degrades soil; Identify factors that contribute to soil erosion; Discuss how leaching degrades soil; Identify and explain how different tillage systems affect soil erosion; Interpret Soil Test Results and make recommendations to a customer on fertilizer needs; Assess quality of different agronomic crops/feeds; Discuss the role of GMOs in 21st century agriculture; Calculate average yield of different crops</p>	<p>PS.01, NRS.04.02, PS.01.03.0.b, BS.03.04, PS.03.05, ESS.01, PS.01.03.05.c, NRS.01.05.04.c, HS-LS2-7, HS-ETS1-2, HS-LS4-6, HS-ESS2-2, CCSS.ELA-Literacy.RST.9-10.3, CCSS.ELA-Literacy.RST.9-10.4, CCSS.ELA-Literacy.WHST.9-10.2a, CCSS.ELA-Literacy.SL.11-12.5, CCSS.ELA-Literacy.RST.11-12.9, CCSS.MATH.CONTENT.HSN.Q.A.2, CCSS.MATH.CONTENT.HSN.Q.A.3, CCSS.MATH.CONTENT.HSN.Q.A.1, CCSS.MATH.CONTENT.HSS.ID.A.2, CCSS.MATH.CONTENT.HSS.ID.B.5</p>	<p>Horticulture, Agronomy, Tillage, Reduced Till, No Till, Buffer Strip, Conservation buffer, Conservation tillage, Contour Tillage, Conventional Tillage, Crop Residue, Cultivation, Fencerow, Field Tile, Mulch Tillage, Plant residue, Ridge tillage, Riparian buffer, Riparian zone, Zone Tillage, Growing Degree Days, GMOs, Fertilizer, Nitrogen, Phosphorus, Potassium, Deficiency, Bt Corn</p>	<p>Soil Fertilizer Problems, Commodity/Horticulture Project (present recommendations to client), Types of Corn Lab, Agronomic and Horticulture Crop Judging, Average Yield Calculations, Crop Genetics Lab, Tillage Assessment, Nutrients and Deficiencies Assessment</p>
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IPM	February (~ 2 weeks)	Explain what IPM is; List the 5 steps of IPM; Describe different methods of pest control that may be implemented; Discuss the benefits of IPM; Identify various pests - insects, weeds, diseases; Identify beneficial insects and natural enemies to common pests; Create an IPM plan for a given scenario	NRS.04.0, PS.03.03, HS-LS2-7, HS-LS4-6, CCSS.ELA-Literacy.RI.9-10.1, CCSS.ELA-Literacy.RI.9-10.8, CCSS.ELA-Literacy.RST.9-10.3, CCSS.ELA-Literacy.WHST.9-10.2, CCSS.ELA-Literacy.WHST.9-10.4, CCSS.ELA-Literacy.WHST.9-10.9	Integrated Pest Management, Action threshold, Biological Control, Chemical Control, Cultural Control, Mechanical Control, Pest	IPM Plan Project; ID Activity; Beneficial Insect Project (Preying Mantis); Benefits and Drawbacks of IPM Discussion
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Animal Science	Feb.-Apr. (~ 8 weeks)	Explain the difference between animal welfare and animal rights; Identify breeds of cattle, equine, swine, goats, sheep, and poultry; Correctly utilize appropriate animal terminology; Identify colors and markings in equine; Explain the history of the swine, equine, and poultry industries; Identify and describe different cuts of meat; Identify the different components of an egg through dissection; Explore different products originating from animal industry; Apply knowledge of terminology and external anatomy to judge dairy cattle.	AS.02.01, AS.02.02, AS.04.02, AS.05.01, AS.06, HS-ETS1-2, HS-LS3-2, HS-LS3-2-3, HS-LS1-2, HS.LS4-6, HS-ETS1-2, AFNR Career Cluster-Animal Systems Pathway Stmt 2, STEM Career Cluster Stmt 4 & 5, CCSS.ELA-Literacy.SI.9-10.6, CCSS.ELA-Literacy.SL.11-12.6, CCSS.ELA-Literacy.L.9-10.6, CCSS.ELA-Literacy.L.11-12.6, CCSS.ELA-Literacy.RST.9-10.4, CCSS.ELA-Literacy.RST.11-12.4, CCSS.Math.Content.HSS.MD.A.3	Animal Welfare, Animal Rights, Sus scrofa, Piglet, Shoat, Gilt, Boar, Sow, Barrow, Farrowing, Bos Taurus, Calf, Bull Calf, Female-Heifer Calf, Bull, Cow, Steer, Calving, Equus Caballus, Foal, Colt, Filly, Stallion, Mare, Gelding, Foaling, Ovis Aries, Lamb, Ram Lamb, Ewe Lamb, Ram, Ewe, Wether, Lambing, Gallus Gallus, Chick, Cockerel, Pullet, Rooster, Hen, Oviparous, Ruminant, Marbling, Holstein, Jersey, Guernsey, Brown Swiss, Ashyire, Milking Shorthorn, Angus, Hereford, Shorthorn, Texas Longhorn, Action, Barren Mare, Black Points, Blemish, Conformation, Dam, Draft Horse, Equitation, Farrier, Hand,	Animal Welfare v. Animal Rights Debate, Hoard's Dairyman Judging Contest, Egg Dissection Lab, Beef Breed Carousel Activity, Swine Breed Poster, Parts of a Horse, Pig, etc. Wkst, Poultry Breed Facebook Post, Polutry Digestion Webquest, Sheep Breed Speed Dating, Ear Notching Wkst.
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Food Science	Apr./May (~2 weeks)	Identify different samples through flavor, aroma, visual cues and/or textural differences; Identify different aromas by wafting samples provided; Design a new food product or reformulate an existing product based on a given scenario; Identify food safety hazards based on knowledge of food safety requirements; Identify a current issue in Food Science and explain its significance in today's society both towards consumers and producers of the food; Explain different ways food is processed and why we use them.	ABS.05.03, FPP.01.02, FPP.02, FPP.03, BS.03.02, HS-LS3-1	Triangle Testing, Food Safety, Canning, Contamination, Cross-Contamination, Food Research, Food Science, Food Technology, Freezing, Genetic Engineering, Good Agricultural Practices (GAPs), Good Manufacturing Practices (GMPs), Packaging, Pasteurization, Preservation, Shelf Stable, Traceback, Vacuum Packaging, Biological Contamination, Chemical Contamination, Physical Contamination	Food Processing and Safety Notes and Activity, Food Product Development, Aroma ID, Triangle Testing, Current Issues in Food Presentation
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Ag Business	May (~ 1 weeks)	Identify and describe the different ways producers can market their products; Explain the advantages and disadvantages of each; Create a marketing plan for a given commodity/product scenario.	ABS.05.01, ABS.05.02, ABS.05.03, ABS.05.03.02.b, AFNR Career Cluster, Statement 7, AFNR Career Cluster - Agribusiness Systems Pathway Statement 1, CCSS.ELA-Literacy.SL.9-10.6, CCSS.ELA-Literacy.SL.11-12.6, CCSS.ELA-Literacy.RH.9-10.7, CCSS.ELA-Literacy.RH.11-12.7, CCSS.ELA-Literacy.L.9-10.6, CCSS.ELA-Literacy.L.11-12.6, CCSS.ELA-Literacy.RST.9-10.4, CCSS.ELA-Literacy.RST.11-12.4, CCSS.ELA-Literacy.W.9-10.2, CCSS.ELA-Literacy.W.11-12.2	Commodity, Market, Marketing, CSA, Wholesale, Direct to Consumer	Marketing option notes, Marketing/Sales Plan Project
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Ag Mechanics	May (~ 1 weeks)	Identify external components of a tractor and explain their purpose; Explain how to safely operate a tractor; Demonstrate safe tractor operation; Identify common areas for injury in the Ag Workforce	PST.02, CDOS 3a	ROPS, Rollovers, Pinch Points, Crush Points, Hydraulics, Clutch, Brake, Gear Shift, Parking Break, Loader Control, Battery, Fuel Tank, Hitch/Drawbar	Tractor Safety and Operation Discussion, Tractor Operation Demo
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Precision Agriculture	May (~ 2 weeks)	Calibrate a hand sprayer and fertilizer spreader, Locate satellites and determine signal quality for a global positioning system, Operate a simulated tractor guidance system, Set up a control system for activating an irrigator, Use GIS to make field boundaries and display a soil sampling grid, Use interpolation to display GIS data, Analyze data using GIS and recommend a seeding application based on soil type, Compare flat rate and variable rate applications by creating basic fertilizer recommendation for each scenario, Use machine learning software to simulate remote sensing and data analysis, Interpret GIS data and identify machine failure.	CRP.02.01, CRP.02.02, CRP.04.01, CRP.04.02, CRP.04.03, CRP.05.01, CRP.06.01, CRP.06.02, CRP.06.03, CRP.08.01, CRP.08.02, CRP.08.03, CRP.11.01, CRP.12.01, CRP.12.02, AG-BIZ 4.3, AG-PST 1.2, AG-PST 1.3, AG-PST 1.4, AG-PST 2.3, AG-PST 3.6, AG-PST 5.1, AG-PST 5.2, AG-PST 5.3, AG-PL 1.1, Ag-PL 3.1, RST.11-12.3, RST.11-12.4, RST.11-12.9, RST.11-12.10, WHST.11-12.4, WHST.11-12.7, WHST.11-12.10,	Drone, Machine Learning, Remote Sensing, Unmanned aerial vehicle, Attribute, Base layer, Database, Feature, Georeferencing, GIS database, Interpolation, Layer, Point, Polygon, Prescription agriculture, Query, Raster, Site-specific management, Spatial data, Variable rate technology, Vector, Value, Yield Map, Qualitative Data, Quantitative Data, Calibration, GIS, GPS, Guidance system, Overlap, Precision Agriculture, Satellite constellation	Activity 3.1.1 Calibration, Activity 3.1.2 Surrounding Satellites, Activity 3.1.4 Guided Operation, Activity 3.2.1 GIS Mapping, Activity 3.2.2 Interpolate Mapping, Activity 3.2.3 Crop Prescription, Project 3.2.4 Prescribed Solution, Activity 3.3.1 Remote Sensing, Activity 3.3.2 Broken Row
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Environmental Science and Natural Resources	June (~ 2 weeks)	Identify tree species common to the Northeast; Demonstrate how to measure tree diameter and number of logs using a biltmore stick; Explain the three pillars of sustainability and how they work together; Describe the difference between conventional and organic agriculture; Explain different practices farms are implementing to be more sustainable.	NRS.01.01, NRS.01.01.02, ESS.03.02, ESS.05.02, HS-ESS2-6, HS-ESS-5, HS-ETS1-4. HS-ETS1-2, AFNR Career Cluster- Natural Resources Systems Pathway Stmt 3, CCSS.ELA-Literacy.RST.11-12.1, CCSS.ELA-Literacy.RST.11-12.2, CCSS.ELA-Literacy.RST.11-12.7, CCSS.ELA-Literacy.EHST.9-12.7, CSS.MATH.CONTENT.HSN-Q.A.1, CSS.MATH.CONTENT.HSN-Q.A.2, CSS.MATH.CONTENT.HSN-Q.A.3	Deciduous, Coniferous, Opposite, Alternate, Leaflet, Simple, Compound, Pinnate, Palmate, Biltmore Stick, Sustainability, Nutrient Mass Balance, Organic, Conventional	Tree ID Project, Tree Diameter and Log Activity, Wildlife Project (Birds Nests & Antlers), Sustainability in Ag Production (Organic v. Conventional & NMB)
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* Means assignments involve writing

**Program Materials /
Resources**

iPad, Postcard
Template, State Fact
Sheets, Jenga games, Ag
Fact Cards, Ag Fiction
Cards, A Day without
Agriculture PPT & Wkst

iPad, 5W's and H of FFA
wkst, FFA Choice Board,
Mission Descriptors,
Comic Stip Template,
Basics of FFA PPT, FFA
Emblem Cut Apart
Activity Sheet, Original
FFA Creed, Updated FFA
Creed, Famous FFA
Members Activity

Intro to SAE PPT, SAE
Note Sheet, SAE Idea
Cards, SAE Ideas Chart,
Careers in Ag Table,
AgExplorer Website
Link, Crossword Puzzle

Composting Note Sheet,
Critical Evaluation
Sheet, Food Waste
Measuring Wkst, Scale,
iPad, Composting
System Presentation
Guidelines/Rubric,
Reflection Sheet,
Materials to build
recommended compost
system

iPad, Edible Plant Parts
Notes, Monocot Seeds,
Dicot Seeds, Flowers,
Grafting materials, Plant
Growth/Repro
Notesheet and PPT,
Edible parts of plants
(taste test)

Hydroponics PPT,
Hydroponic Systems
Advantages and
Disadvantages,
Hydroponic Growing
Information,
Hydroponic
Management Planning
Guides, iPad, School
Hydroponic Systems

iPad or Computer, Soil
Color Book, Soil pH Test
kit, Soil Texture Flow
Chart, Soil Texture
Triangle, Soil Samples,
Soil Probes, Soil Test
Results, Edible Soil
Profile Materials, Soil
Note Sheets

Soil Fertilizer Problems,
Client Scenario and
Crop Growing
Information, Hay
Samples, Silage
Samples, Grain Samples,
Apple Samples, Potato
Samples, Note sheets
(tillage and nutrients),
iPad, Calculator, Global
Crop Map

Insect, Weed, and
Disease images; IPM
Notesheet; IPM PPT;
Grower scenarios; iPad

iPad, Hoard's Dairyman
cow classes, Eggs,
Plates, External Parts of
Animals Wksts, Ear
Notching Wkst, PPTs
and Notesheets, Poster
template, Facebook
post template, Debate
scenario and organizer,
Speed Dating Handout,
Poultry Digestion
Webquest wkst.

Extract/Aroma Samples,
Food or Beverage
samples for
triangulation test, iPad,
Food Product
Development Scenario
and ingrediants, Food
Safety complaints and
pictures for ID,
Notesheets, PPTs,
Current Issue
assignment details

Commodity/Product
Scenario, Notes & PPT
on different market
options

Tractor Safety Notes,
Tractor

Cat litter, Outdoor area with a clean, dry surface, Water source with a hose, Device with timer, Masking tape, Plastic spoon, Tape measure 25', Weighing dish, Electronic balance, Handheld fertilizer spreader, Handheld sprayer, Measuring cup, PPE, iPad, Mobile device w/ GPS, Survey flags, SMS Software, Calculator, Notebook, Lobe Software, Permanent Marker, Planting tray with holding tray 12 cell, Soil media, Spray bottle, Webcam, Highlighters (green, pink, yellow)

Biltmore Sticks, iPad,
Trees, Sustainability
Note Sheet, Wildlife
Project Guidelines









































































