Lehighton Area School District
Curriculum Framework

Course Title:	Agricultural Science
Content Area:	Science
Grade Level(s):	10, 11,12 (Pre-req. - Biology)
Course Overview:	Agricultural Science will explore various aspects of the agriculture sector including but not limited to soil biology, hydroponics, plant structure, function and propagation, fruit production, mycoculture, beekeeping, animal husbandry, dairying, and livestock management. Throughout the course, students will be challenged to think differently, to consider impacts on the soil, and on the world. Students will compare and contrast the differences between Integrated Pest Management (IPM) and holistic approaches. Students can expect to visit several local farms throughout the year. Students will utilize the wisdom of Aristotle (Linkage, location and lettering) and the DSRP (Distinctions, Systems, Relationships, Perspectives) frameworks throughout the course for their educational enrichment.
PA Core Standards:	STEELS Standards Academic Standards for Environment and Ecology
Key Course Text and Materials:	*Agriscience: Fundamentals and Applications*, LAHS Orchard
Key Assessments/Projects:	Supervised Agricultural Experience (SAE) - Workforce skills training, Midterm Exam, Final Exam

Big Idea/Unit:	Intro to Agriscience & Careers in Agriscience			
Pacing:	Weeks 1-3			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.1.9–12 3.2.9–12 3.4.9-12 A-C 4.1.12.A,B,C 4.1.9–12 4.4.12.A, B ABS.01.01 AS.01.01 CRP.01 CRP.03 ED.01.01 NRS.01.01 PS.01.01 PST.01.01	Explain agriculture education, agriculture, agriscience and their role within an interdependent world Differentiate between various different types of agribusinesses and business that support agriculture. Identify and explain the three basic sciences List 5 applied sciences and explains their role in agriculture Be able to defend the role agriculture plays within the state, national, and global economy	Ag Mechanics ag science profession Agribusiness agricultural economics agricultural Engineering agricultural processing, products, and distribu agricultural supplies and services Agriculture Agriculture Education Agriculture Educator Agriscience agronomy animal science technology animal sciences Aquaculture biochemistry biology Biotechnology chemistry entomology enviornment Forestry geography High Technology Horticulture Integrated pest Management (IPM) mathematics ornamentals production agriculture profession psychology Renewable Natural Resources sociology Soil Science statistics Supervised Agricultural Experience (SAE) Technology water resources	Intro PPT Careers PPT Intro Fill in the Blank Notes Career Fill in the Blank Notes Prefix and Suffix List Crossword Puzzle Study Guide SAE Contract & Hour Log	Introduction to Agriscience Test Prefix/Suffix Quiz Ag Systems Infographic

Big Idea/Unit:	SAE (Supervised Agricultural Experience) Introduction			
Pacing:	Week 4 (Project ongoing throughout year)			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**

4.1.12 F 4.3.12 C 4.4.12 E 4.5.12 F	Gain hands on career-readiness skills. Make visual presentations to express ideas Speak in front of a class to demonstrate and highlight their new skills	Supervised Agricultural Experience (SAE) Agriculture Education	SAE Contract SAE Log	SAE Project

Big Idea/Unit:	**Air Quality & Soil & Water Conservation**			
Pacing:	**Weeks 4-6**			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.4.9-12 I 3.4.9-12.C 3.4.9-12.D 3.4.9-12.E 3.4.9-12.F 3.4.9-12.G 3.4.9-12.H 4.1.12B 4.2.10.A 4.2.10.B 4.2.10.C 4.3.10.A-C 4.3.12.A-C NRS.01.01-5 NRS.02.01-05 NRS.03.01	Actively and skillfully interpret, analyze evaluate and synthesize the role air, water soil and climate play in the growth of crops and livestock Explain the imortance of conservation Demonstrate how to manage resources(air, soil and water) to improve sustainability Students will analyze and be able to defend the statement, "Pesticides, feritlizers and other synthetic chemicals contribute to a decrease in health, well-being and overall ecosystem health"	air asbestos carbon monoxide chloroflourocarbons Compost greenhouse effect habitat hydrocarbon Macronutrients Micronutrients nitrous oxide ozone particulate pesticides photosynthesis radioactive material radon respiration soil sulfur tetraethyl lead water aquifer capillary water conservation tillage contour contour farming crop rotation fertilizer food chain free water Fresh water grass waterway gravitational water hygroscopic water	Air & Pollution PPT Water & Soil Conservation PPT Air & PollutionFill in the Blank Notes Water & Soil Conservation Fill in the Blank Notes Study Guide Crossword Puzzle Pollution Concept Maps	Natural Resources Test Soil Particle Lab Loop Lake Project

	Analyze ag problems linked to pollution and explain ways to improve environment quality	hygroscopic water irrigation Land degradation land erosion lime mulch no-till Potable sheet erosion strip cropping terrace tidewater water cycle water table watershed		
	Show knowledge of the flywheel of soil health			

Big Idea/Unit:	**Soil & Hydroponics Management**			
Pacing:	**Weeks 7-9**			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
	Explain the role of microbes within in the soil.	A horizon Acidity active ingredient Aeroponics Alkalinity alluvial deposit B Horizon Bedrock C Horizon capability class clay colluvial deposit Compost decomposer fertilizer grade glacial deposit		
	Identify, explain and analyze different soil particles, horizons and their respective chemical makeups		Soil Fill in the Blank Notes Soil Crossword	Soil Test Soil Sample Lab Hydroponics Lab

		glacial deposit Horizon Hydroponics		Soil Crossword Soil Sample Soil Study Guide
3.4.9-12 A, F 4.2.12 A-D 4.3.12 A-C 4.1.10.D 4.4.10 D PS.01.01 PS.01.04	Explain the role or mycorhizae and saprophytic fungi withint the soil	lacustrine depsoit Loam loess deposit Medium Neutral Nitrate Nitrogen fixation O horizon Peat moss percolation perlite pH		
	Demonstrate knowledge of the flywheel of soil health and its components and how it relates to overall health and well-being	residual soil sand silt soil amendment Soil profile Soil Structure Sphagnum starter solution Subsoil topsoil vermiculite		
	Calculate the percentage of macronutrinets in a bag of fertilizer using the NPK ratio	Riparian Zone Buffer Zone		

Big Idea/Unit:	**Plant Structures & Taxonomy**				
Pacing:	**Weeks 10-13**				
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**	

Identify, explain, and constrast various parts of plants

Explain the significance and guidlelines used for botanical and scientific taxnomical classifcation

3.1.9-12.B
3.1.9-12.B
3.1.9-12.E
4.1.12.C
4.4.10-12
PS.01.02-03
PS.02.01-03
PS.03.03
PS.03.04

Locate various parts and their function of the plant

adentitious root
anther
axil
binomial
bulb
calyx
chloroplast
compound leaf
corm
cuticle
epidermis
family
Fibrous Root
filament
floral bud
flower
fruit
genus
guard cell
Herbaceous
internode
leaf blade
margin
ovary
ovule
perfect flower
petal
petiole
phototropism
pistil
pollen
pollination
root cap
root hair
sepal
simple leaf
species
stamen

Plant Anatomy Crossword
Plant AnatomyFill in the Blank Notes
Monocot vs Dicot wkst
Root Coloring/Model
Stem Coloring/Model
Leaf Coloring/Model
Flower Coloring/Model
Leaf Handout
Plant Taxonomy Webquest
Help Wanted Wkst

Plant Anatomy Test with Lab Practical
Plant Anatomy Quiz

		stigma stoma/stomata style Taproot taxnomy terminal bud tuber vegetative bud xylem		
	Differentiate between different stem modifcations: aerial, sub-aerial, and underground			

Big Idea/Unit:	**Plant Reproduction**			
Pacing:	**Weeks 14-15**			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.4.9-12A,B PS.03.01 PS.03.02 PS.03.04	Analyze, evaulate, synthesisze and propagate plants through division, grafting, cuttings and seed starting. Explain how a given plant can reproduce sexually and asexually Utilize honey as a natural rooting hormone to propagate plants via cuttings Identify layering and able to describe the process of how to conduct simple layering	Propagation Sexual reproduction (seed production) Asexual reproduction Hybrid Vigor Germinate Dormant cutting fungicide rooting hormone stem tine cutting stem section cutting cane cutting heel cutting single-eye cutting double-eye cutting leaf petiole cutting simple layering tip layering air layering grafting scion rootstock graft union bud grafting T-budding	Plant Reproduction Fill in the Blank Notes Packet	Cutting Lab Grafting Lab Plant Reproduction Project Iris Rhizome Division Lab

Big Idea/Unit:	Home Gardening			
Pacing:	Weeks 16-18			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
PS.03.04 PS.04.01 3.1.9–12.A, B, C, D 3.3.9–12.A, C 4.4.9–12.A,B, C, D, E, F PS.02.01, 03 3.4.9-12A, B, C PS.01.02 PS.03.01 PS.04.01-02 PS.05.01-02	Identify companion plants and companion planting principles to better start and grow a garden Explain (hopefully implement at home) how to start a garden Explain and create a regimen managing pests through conventional or organic means using IPM Differentiate between the terms GMO, bioengineered, heirloom, open-pollinated, organic, regenerative, and conventional Grow vegetables, flowers and herbs by seeds and care for them in an organic system to improve taste and bioactive compounds	Monocot Dicot Cotelyedon Companion Planting Seasonal loam clod furrow climate annual biennial perennia cultivation herbicide cold frame hotbed	Gardening Crossword Gardening Fill in the Blank Notes Victory gardens Wkst Companion Planting Handout	Garden Plan Project Companion Planting Project

Big Idea/Unit:	Vegetable Production			
Pacing:	Weeks 19-20			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.1.9–12.A, B, C, D 3.3.9–12.C 3.4.9–12.A, C, D 4.4.9–12A,C, D, E, F PS.03.01,03, 04 PS.04.01-02	Identify and explain the use of various farming implements used to produce vegetables Compare and contrast the difference between vegtable systems Explain and create a regimen managing pests through conventional or organic means using IPM Explain and draw various different methods of production(truck cropping, market gardening, etc), walkways between rows, etc.	olericulture market gardening truck cropping olericulturist angiosperm monocot dicot aeration green manure transplant arid semiarid pre-cooling hydrocooling	Vegetable production PPT Vegetable Production Fill in the Blank Notes Vegetable Production Crossword Vegetable Production Study Guide	Vegetable Production Test Produce production Farm Implement Quiz

Big Idea/Unit:	Fruit & Nut Production

Pacing:	Weeks 21-22			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
	Demonstrate how to properly prune a fruit tree			
3.1.9-12A,B 3.2.9-12A 3.3.9-12A	Demonstrate how to graft a fruit tree			
3.4.9-12F 3.4.9-12G 3.4.9-12H 3.5.9-12A 4.1.12A,B,C,D,E 4.1.9-12A,C,D,E 4.4.9-12A,B 4.5.9-12A,B,C FPP.02.02 FPP.04.04 PS.03.01 PS.03.01-02 PS.03.02 PS.04.01 PS.04.01	Demonstrate how to plant a fruit tree/bush Explain and create a regimen managing pests through conventional or organic means using IPM Students will explain safe handling techniques post-harvest Explain and identify various parts of fruit and nut trees, bushes, vines, and canes Defend various treatment options for pests: IPM, holisitc, organic, etc. List micro and macro nutrients needed for fruit and nut production	Cane Crown Drupe Dwarf Nursery Pome Pomologist Rootstock Scion wood Semidwarf Terminal cane	Fruit & Nut PPT Fruit & Nut Crossword Fruit & Nut Fill in the Blank Notes Holistic Orcharding DVD LAHS Orchard	Apple Grafting Lab Apple Pruning Lab Orchard Management Plan
	Identify various areas to consider for managing fruit and nut crops			

Big Idea/Unit:	Grain, Oil, and Specialty Field Crop Production			
Pacing:	Weeks 23-24			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.1.9–12.A 3.4.9–12.A 3.4.9–12.B 4.2.9–12.A 4.3.10.A / 4.3.12.A 4.4.10.A 4.4.10.D 4.4.10.D / 4.4.12.D 4.4.12.B 4.4.12.D NRS.02, NRS.03 PS.01, PS.03 PS.02.01, PS.02.02 PST.02, PST.03	Explain production of grains, oil seed crops, and specialty crops Identify various grains and oilseed crops though visuals Compare strip cropping and other methods of production to add tilth to the soil Differentiate between grain harvesting, planting and soil prepping implements and tractor PTO attachments	forage oilseed crop linen linseed oil ginning cash crop cereal crop seed legume crop root cap stimulant crop thermal requirement conventional tillage minimum tillage sprinkler irrigation surface irrigation drip irrigation	Grain Fill in the Blank Notes Grain Crossword Grain Implement Wkst	Grain Test Grain Quiz

Big Idea/Unit:	Genetics, Breeding, and Reproduction
Pacing:	Week 25

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.1.9-12A-C 3.3.9-12A-C 3.4.9-12A,B 4.4.9-12A, C-F AS.01.02 AS02.01-03 AS03.01-03	Explain the principles of genetics and heredity by identifying dominant and recessive traits, interpreting basic genetic terminology, and predicting offspring outcomes using Punnett squares and simple breeding records. Compare and evaluate animal breeding methods and how stock can be bred to improve a flock Analyze how selective breeding decisions impact animal health, productivity, and agricultural systems by evaluating real or simulated breeding scenarios and considering ethical, economic, and environmental factors.	Punnet Square Dihybrid Monohybrid Homozygous Heterozygous	Punnett Square Worksheet Genetics practice Genetics Fill in the Blank Notes Genetics Chapter Review	Genetics Quiz

Big Idea/Unit:	Poultry Production
Pacing:	Week 26-30

Standards	Objective/Skill	Vocabulary	Additional Resources	Assessment/Project
3.1.0-12A,B,C,D 3.3.9-12.A-C 3.4.9-12A-C 4.4.9-12.A,C, D, E, F AS.01.01-02 AS.02.01-03 AS.04.01-02 AS.07.01-02	Identify the anatomy of chickens, ducks and geese Explain the production of eggs and meat Explain the hatching process of chicken, duck, goose and other poultry/exotic fowl Create a plan to care for a sick, injury, or health bird taking into account food, supplements, access to pasture/free range, etc.	Egg Pullet Hen Rooster Drake Goose Gander Albumen air cell vertebrates Ovum Egg gland Chalazae Broody Chick/Peep Clutch Point of Lay Pipping Comb Wattle Hackle Saddle Grit Show Breed Heritage Breed Layers Broilers	Chicken Coloring Poultry Chapter Review Poultry Juding Activity Everything but the Cluck wkst Chick Hatching Lab	Poultry Management Project

Big Idea/Unit:	Dairying Production			
Pacing:	Weeks 31-34			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**
3.1.9–12.A–D 3.3.9–12.A–C 3.4.9–12.A–C 4.4.9–12.A, C, D, E, F AS.01.01, AS.01.02 AS.02.01, AS.02.02 AS.04.01, AS.04.02 AS.06.01, AS.06.02 AS.07.01, AS.07.02	Identify various anatomical parts of bovines Explain various bovine production terms Explain, compare and contrast bovine management methods	Cow Heifer Steer Bull Dairy Beef	Dairying Modern Marvel Video Virtual Tour of dairy farm Farm Vet Presentation	Dairying Project

Big Idea/Unit:	Final Review			
Pacing:	Last remaining weeks			
Standards	**Objective/Skill**	**Vocabulary**	**Additional Resources**	**Assessment/Project**

Agricultural Science is a course mainly made up of upper-classmen. The last remaining weeks of the school-year are dedicated to reviewing all that has been discussed in the course and given to final lab report construction. For the final exam, students have the option to either complete a full laboratory report, common in agriculture based courses at the colleiagte level or to complete a ful 100 question exam. The lab report can be completed prior to the final exam day.