



## Growing Our Future Podcast – Episode 15 Lesson Plan

**Lesson Title:** “The Value of Agricultural Science Education”

**TEKs:** (c) Knowledge and skills.

(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:

(A) identify career development, education, and entrepreneurship opportunities in the field of agriculture, food, and natural resources;

(B) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation in agriculture, food, and natural resources;

(D) analyze employers' expectations such as appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills; and

(E) identify careers in agriculture, food, and natural resources with required aptitudes in science, technology, engineering, mathematics, language arts, and social studies.

4) The student explains the historical, current, and future significance of the agriculture, food, and natural resources industry. The student is expected to:

(B) analyze the scope of agriculture, food, and natural resources and its effect upon society;

(C) evaluate significant historical and current agriculture, food, and natural resources developments;

(D) identify potential future scenarios for agriculture, food, and natural resources systems, including global impacts;

(6) The student demonstrates appropriate personal and communication skills. The student is expected to:

(A) demonstrate written and oral communication skills appropriate for formal and informal situations such as prepared and extemporaneous presentations; and

(B) demonstrate effective listening skills appropriate for formal and informal situations.

*Note. TEKs taken from the Principles of Agriculture, Food, and Natural Resources Course. However, similar TEKs can be found within any of the AFNR courses.*

**Terminal Performance Objective:**

Through class instruction and the evaluation of the Growing Our Future podcast episode students will evaluate the three-circle model and compare it to your agriculture science program according to the criteria outlined by the instructor.

**Enabling Objectives:**

1. Recognize needs within the agriculture industry.
2. Identify emerging technologies within the agriculture industry.
3. Analyze the criteria needed to be a successful agriculture science teacher.
4. Connect lesson activities to the three-circle model.
5. Evaluate the layout of the three-circle model and compare it to your agriculture science program.

**Vocabulary:**

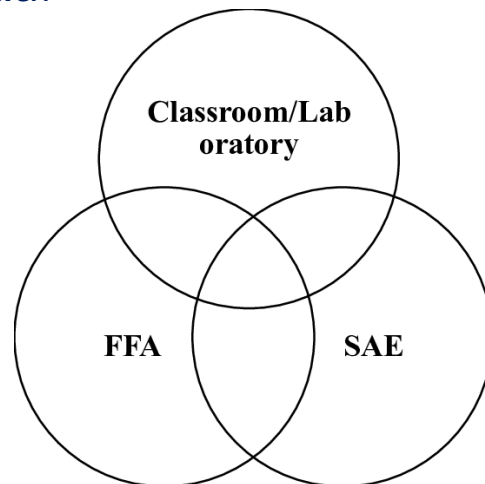
- **AFNR** - Agriculture, Food, and Natural Resources
- **Agricultural Robots** – Also known as agbots, these are used to automate agricultural processes, such as harvesting, fruit picking, ploughing, soil maintenance, weeding, planting, irrigation, etc.
- **Air and Soil Sensors** – these sensors would enable a real time understanding of current farm, forest or body of water conditions.
- **Aquifers** – a body of permeable rock which can contain or transmit groundwater.
- **Career Success** - FFA develops members' potential and helps them discover their talent through hands-on experiences, which give members the tools to achieve real-world success.
- **Competitive Edge** - it is that special “something” .. the “it” ... that gives an advantage to a person or business over their peers. Many times, we don't know what “it” is, but we know they have it. Students involved in the agricultural education and FFA generally have a competitive edge over their peers who do not participate in the program. Their edge is evident in soft skills, work ethic, teamwork, problem solving, and communication.
- **Crop Sensors** – crop sensors inform application equipment of correct amounts needed.
- **Entrepreneur** – a person who organizes and manages any enterprise, especially a business, usually with considerable initiative and risk.
- **Evaporation** – is a type of vaporization that occurs on the surface of a liquid as it changes into the gas phase.
- **Experiential Learning** — Learning experiences that usually take place outside of the classroom, supervised by the agriculture instructor.
- **FFA** - provides the next generation of leaders who will change the world. 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.
- **FitBits for Livestock** – Collars with GPS, RFID and biometrics can automatically identify and

**Bell Work:**

Answer the following series of questions to the best of your ability:

1. What are the three components of the Agricultural Science Education Three-Circle Model?

**Answer:**



2. What is an “Entrepreneur”?

**Answer:** a person who organizes and manages any enterprise, especially a business, usually with considerable initiative and risk.

3. By what percent, could agriculture technologies improve food production?

**Answer:** Agricultural technologies could increase global crop yields up to 67%. Increased demand for food due to population and income growth, and the impacts of climate change on agriculture will ratchet up the pressure for increased and more sustainable agricultural production to feed the planet.

4. Name five careers found within the agriculture industry.

**Answers will vary.**

5. Select one agriculture-based career and answer the following questions:

- a. Describe the career in three to five sentences.
- b. How much would a person with this career make?
- c. Why is this career important to agriculture?

relay vital information about the livestock in real time.

- **Food Production** - is all about preparing food, in which raw materials are converted into ready-made food products for human use either in the home or in the food processing industries. Its process comprises scientific approaches.
- **GMO's (Genetically Modified Organisms)** – The creation of entirely new strains of food animals and plants in order to better address biological and physiological needs.
- **GPS (Global Positioning Systems)** – are being used for farm planning, field mapping, soil sampling, tractor guidance, crop scouting, variable rate applications, and yield mapping.
- **Infrastructural Health Sensors** – used for monitoring vibrations and material conditions in buildings, bridges, factories, farms and other infrastructure.
- **In-vitro Meat** – Also known as cultured meat or tube steak, it is a flesh product that has never been part of a complete, living animal.
- **Irrigation** – the supply of water to land or crops to help growth, typically by means of channels.
- **Leadership Education** — delivered through student organizations such as the National FFA Organization, the National Young Farmer Education Association, National Postsecondary Agricultural Student Organization and others.
- **Networking** - is a way to engage with other individuals in order to make connections that can be helpful for both you and the other person in the future. These connections can be used throughout life to help move forward in both business and personal interest. Making valuable connections can help you find your next job, hobby or friend!
- **Personal Growth** - The positive evolution of the whole person.
- **Precision Agriculture** – Farming management based on observing (and responding to) intra-field variations.
- **Premier Leadership** – is Action, Relationships, Vision, Character, Awareness, Continuous Improvement
- **Retailers** – a person or business that sells goods to the public in relatively small

**Answers will vary.**

*After class discussion, explain, “Entrepreneurial skills are important for you to possess as the global economy is driven by innovative people with dynamic communication skills. The following activities will challenge you to think about needs in the agricultural industry, tap into their creative thinking, and communicate your ideas with others.”*

<p>quantities for use or consumption rather than for resale.</p> <ul style="list-style-type: none"> <li>• <b>Supervised Agricultural Experience (SAE)</b> – the SAE program involves practical agricultural activities performed by students outside of scheduled classroom and laboratory time. SAEs provide a method in agricultural education for students to receive real-world career experiences in an area of agriculture that they are most interested in. Supervised Agricultural Experiences are an important component of agricultural education and are required element of all Agriculture, Food and Natural Resources (AFNR) courses.</li> <li>• <b>Soft Skills</b> - Employers seek candidates with a strong set of "soft skills." Soft skills are known as personal skills, non-technical skills, and interpersonal skills.</li> <li>• <b>TEA – Texas Education Agency</b></li> <li>• <b>Teamwork</b> - The process of working collaboratively with a group of people in order to achieve a goal. Teamwork is often a crucial part of a business, as it is often necessary for colleagues to work well together, trying their best in any circumstance.</li> <li>• <b>TEKs – Texas Essential Knowledge and Skills</b></li> <li>• <b>Three Circle Model</b> – classroom and laboratory instruction, leadership development, and experiential learning.</li> <li>• <b>Vertical Farming</b> – A natural extension of urban agriculture, vertical farms would cultivate plant or animal life within dedicated or mixed-use skyscrapers in urban settings.</li> <li>• <b>Wholesaler</b> – a person or company that sells goods in large quantities at low prices, typically to retailers.</li> </ul>	
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**Preparation**

<b>Instructor Notes</b>	<b>Activity Notes</b>
<p><i>Ask the class, "Have you ever seen the show 'Shark Tank'? It's where budding entrepreneurs get the chance to bring their dreams to fruition in a reality TV show. They present their ideas to the sharks in the tank -- five titans of industry who made their own dreams a reality and turned their ideas into lucrative empires. The contestants try to convince any one of the sharks to invest money in their idea. When more than one of the sharks decide they</i></p>	

*want a piece of the action, a bidding war can erupt, driving up the price of the investment.*

*If you're an aspiring entrepreneur, you may need any help you can get to make it big. After Johnny Georges came up with his own great idea, he landed a spot on the show Shark Tank. Once the humble farmer appeared in front of the panel of potential investors, though, he faced some tough, probing questions. Would he be able to keep his cool under such scrutiny? Let's see..."*

**Show the "Shark Tank Episode — Tree T-Pee" Vimeo Video.**

**After watching the video, ask the class, "What exactly does the tree teepee do?"**

**Allow time for discussion, then show the "Tree T-Pee | The Henry Ford's Innovation Nation" YouTube video.**

**Explain to the class, "Johnny Georges is a self-made entrepreneur who saw a problem within agriculture and has now come up with a solution for the problem. So, what is an entrepreneur?"**

**After some class discussion, explain, "An Entrepreneur is a person who organizes and manages any enterprise, especially a business, usually with considerable initiative and risk."**

**Tell the class, "On a piece of paper, write the following three questions. You'll have five minutes to answers, and then we will discuss your responses as a class."**

**Explain to the class, "New technologies and inventions are continuously being developed to not only improve the efficiency of agriculture production, but they also help improve the overall quality and general health of us as humans. For example, how many of you have a smart phone or smart watch that calculates the number of steps you take per day?"**

**Shark Tank Episode — Tree T-Pee Vimeo Video Link:**  
<https://vimeo.com/489449242>

**Tree T-Pee | The Henry Ford's Innovation Nation YouTube Video Link:**  
<https://www.youtube.com/watch?v=p9SJeBTl8Xo>

**Show Slide 1 of the "Emerging Technologies" PowerPoint.**

**Show Slide 2 of the "Emerging Technologies" PowerPoint.**

**Write the following questions on a piece of paper:**

1. What need do you see in the agricultural industry?
2. What type of product could be developed as a solution to this need?
3. What qualities does the man in the video possess that contributes to his success?

*The pedometer sensor, which we will learn more about, was first invented for the use in cattle. How many of you would like to be an organ donor or would be grateful to except an organ transplant if you ever needed one?*

*Did you know that livestock organs and blood have been used in place of human organs? For example, several swine heart valves have been used in heart patience as well as skin grafts for burn victims and medicines made from animal blood.*

*As we discuss the emerging technologies in agriculture, write on your paper information that stands out to you about each technology. You don't have to write down the content word for word. Summarize the information that speaks to you.*

*We will have follow-up questions at the end of the PowerPoint slides. We will discuss the follow-up questions as a class, and they will be worth a participation grade."*

**After discussing the student's responses to the questions on slide 2, introduce the slides 3 – 10 of the "Emerging Technologies" PowerPoint. Have student take notes over the slides. Allow time for discussion as the student summarize the content for each slide.**

**12 Emerging Agriculture Technologies:**

- Agricultural robots
- Air & soil sensors
- Crop Sensors
- FitBits for Livestock
- GMO's (Genetically Modified Organisms)
- GPS (Global Positioning Systems)
- Infrastructural health sensors
- In-vitro meat
- Precision agriculture
- Vertical farming

**Tell the class they will have follow-up questions at the end of the PowerPoint slides. Discuss the follow-up questions as a class. Student engagement should reflect their participation grade for the day.**

**Agriculture Reflection Questions:**

**Write the following questions on a piece of paper:**

1. What need do you see in the agricultural industry?
2. What type of product could be developed as a solution to this need?
3. What qualities does the man in the video possess that contributes to his success?

**Presentation**

**Instructor Notes**

**Explain to the class, "Let's list all the career areas within agriculture we have discussion so far... (allow students to contribute to the list)**

- Plant Science

**Activity Notes**

**List the "career areas" on the board as the students and you name them off.**

- *Animal Science*
- *Engineering*
- *Research*
- *Food Science*
- *Production Agriculture*
- *Entrepreneurship*
- *And the list goes on and on...*

*We could even include Agriculture Marketing, Distribution, Communications, etc. Because we need all these industries in order to develop these emerging technologies.”*

**Ask the class,** *“Is there a career area missing from our list?”*

**Wait for responses, then ask,** *“What about agricultural education? ... Do you believe any of these inventions would have emerged if someone haven’t educated the researcher or inventor about the issue at hand or how to create the technology? What about Johnny Georges? Who was the agriculture educator in his life?”*

**(Wait for responses)**

*Johnny’s inspiration was his dad who was a farmer and agricultural educator to his son.”*

**Ask the class,** *“So, who are agricultural educators? Do they have to be a classroom teacher, or can they be a friend, family member, industry expert, extension agent?”*

**Wait for responses, and then say,** *“An agricultural educator can be any one around you who is an expert in a particular agriculture topic.*

*However, a professional agricultural educator is someone who teaches students about agriculture, food, and natural resources. Agricultural educators teach students a wide variety of skills, including science, math, communications, leadership, management, and technology.”*

**Explain to the class,** *“Agricultural education is delivered through three interconnected components:*

**Draw the Agricultural Science Education Three-Circle Model on the board and label the following information in each circle.**

- Classroom or laboratory instruction.
- Experiential learning — Learning experiences that usually take place outside of the classroom, supervised by the agriculture instructor.

What do we call the Experiential Learning Component?

**Allow time for responses, and then tell the class,** “We call experiential learning SAE’s or supervised agriculture experiences. The last circle of the model is the Leadership education component or the FFA component. Many high school agriculture programs use FFA to enhance the leadership and experiential learning portions of their program.”

**Ask the class,** “Now that we know all the components of a professional agricultural educator’s career, what professional characteristics one need to be a successful agricultural science teacher?”

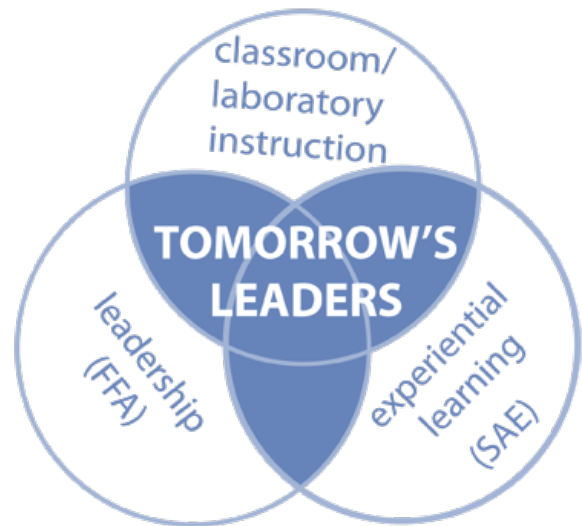
**Allow time for class discussion, and then explain,** “Today we are going to hear from two former agricultural science teachers.

*These former agricultural science teachers and now statewide experts in education, draw on decades of experience to gives us a rare look at the demanding and rewarding reality of ag. teachers across the country.”*

**Tell the class,** “While you are listening to today’s podcast video, you will be taking notes using a Venn Diagram. How many of you have used something similar to this before?”

**(Wait for responses)**

*Venn Diagrams can help you quickly and efficiently compare and contrast two or more ideas or subjects. A Venn Diagram is two overlapping circles, one circle for each subject you are comparing. In the central area where they overlap, list the traits the two items have in common.”*



**Provide students with the “Comparison vs. Contrast Venn Diagram”** handout. Have students take notes on specific dialog that speaks or resonates with them over the two podcast episodes. Have them record their information in the designated podcast episode sections of the Venn Diagram.

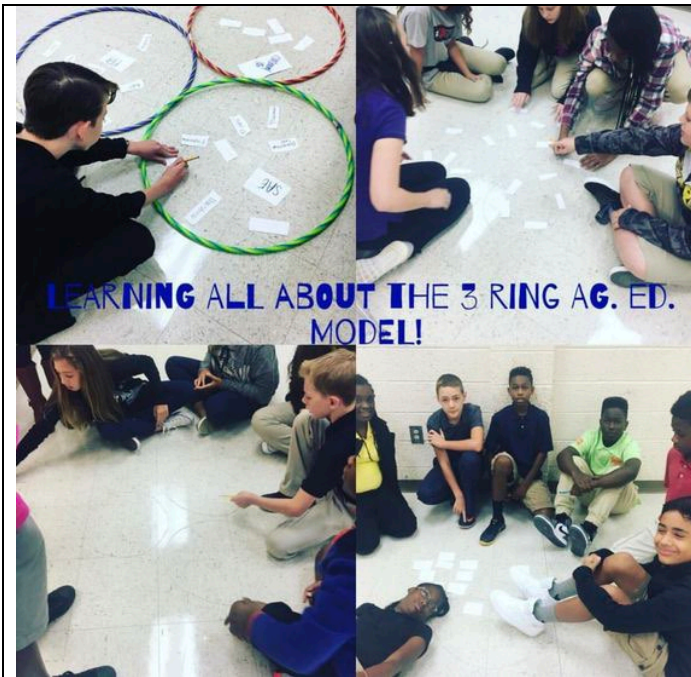
**Episode 15 - Growing Our Future Podcast Link:**  
<https://www.youtube.com/watch?v=C3PoFZLYNgo&t=130s>

**Growing Our Future Podcast – AFNR Link:**  
<https://www.youtube.com/watch?v=lpKAXNLZrFc>

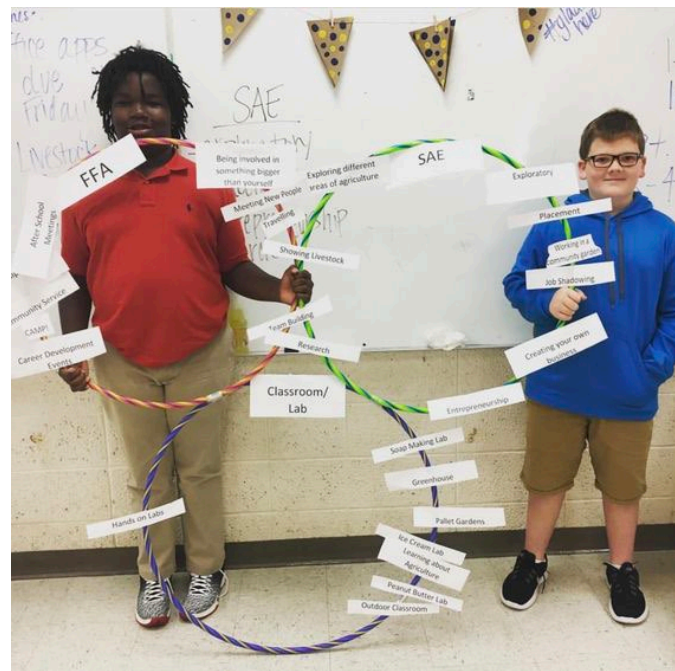
**Discuss the ‘Discussion Questions’ as a class.**



<p><b>Tell the class, “Once you have completed your Venn Diagram, please complete the discussion questions on a separate piece of paper.”</b></p>	
<p><b>Application</b></p>	
<p><b>Instructor Notes</b></p>	<p><b>Activity Notes</b></p>
<p><b>Following the podcast video, tell the class, “Now that we understand a little more about agricultural education, let’s further explore the three-circle model.”</b></p> <p><b>Ask the class, “How should the three-circle model be labeled? I need three volunteers.</b></p> <p><b>Ask the class, “How does Johnny Georges’ Tree Teepee invention and sale’s pitch fall into the three-circle model? I need three more volunteers.”</b></p> <p><b>Explain to the class, “All the activities listed on these slips fit into the three-circle model. Throughout this course, each of you are going to explore and advance your premier leadership, personal growth, and career success.”</b></p>	<p><b>The following activity can be done by breaking the class into groups or as a whole class.</b></p> <p><b>Teacher Materials:</b></p> <ul style="list-style-type: none"> <li>• 3 Hula-hoops (Colors: Gold, Blue, Red)</li> <li>• <i>Three Circle Model_Slips Handout*</i></li> </ul> <p><b>Teacher Notes:</b></p> <p><b>Step 1</b> - Cut out the <i>Three Circle Model_Slips Handout</i> Prior to beginning of class.</p> <p><b>Step 2</b> - Lay out the three hula-hoops separately on the ground at the front of the classroom, and ask the class to come up to the front of the room.</p> <p><b>Step 3</b> - Have the class properly discuss how the three-circle model is structured, and have students lay the hula-hoops on the ground to match the actual model.</p> <p><b>Step 4</b> – Ask for three volunteers and hand them the slips titled:</p> <ul style="list-style-type: none"> <li>• Leadership/FFA</li> <li>• SAE</li> <li>• Classroom/Laboratory Instruction</li> </ul> <p>Have the class place the slips in the proper circles.</p> <p><b>Step 5</b> - Hand the class the three slips titled the following and ask them to place them in the correct circle:</p> <ul style="list-style-type: none"> <li>• Product Research (<b>Answer:</b> Class/Lab)</li> <li>• Product Development (<b>Answer:</b> SAE = Entrepreneur)</li> <li>• Product Pitch (<b>Answer:</b> Leadership/FFA)</li> </ul> <p>Have the class place the slips in the proper circles.</p> <p><b>Step 6</b> - Hand the class the rest of the slips titled the following and ask them to place them in the correct circles. Some of these slips may fit in multiple circles or the overlapping portion of the model:</p> <p>(Class/Lab)</p> <ul style="list-style-type: none"> <li>• Outdoor Classroom</li> <li>• Hands on Learning</li> </ul>



**LEARNING ALL ABOUT THE 3 RING AG. ED. MODEL!**



- Greenhouse Labs
- Soup Making Lab
- Plastic Making Lab
- Egg Lab
- Ice Cream and Butter Lab
- Peanut Butter Lab

(SAE = Entrepreneur)

- Exploratory “Research”
- Placement “Working for Someone”
- Entrepreneurship “Creating Your Own Business”
- Job Shadowing
- Working in a Community Garden
- Showing Livestock
- Science Fair Project
- Teaching Others
- Growing Your Own Plants

(Leadership/FFA)

- Career Development
- Community Service
- Leadership Development
- Camps
- Conventions
- Conferences/Workshops
- Meeting New People
- Team Building
- Traveling
- Being involved in something BIGGER than Yourself!

### Evaluation / Summary

#### Instructor Notes

**Explain to the class, “Not every agriculture science program is equally divided or portioned as the three-circle model is. Some programs focus more on the classroom experience, then FFA, then SAEs. Or some programs may focus more on SAEs and FFA, and not so much on the classroom.”**

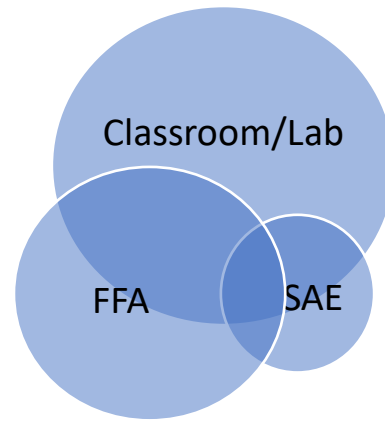
#### Activity Notes

**Draw the following examples on the board as you discuss with the class.**

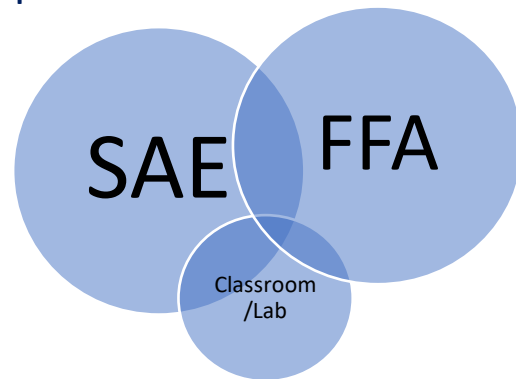
**Tell the class,** *“On your piece of paper, I want you to draw how you believe our agriculture science program is structured.”*

*This activity will count as a participation grade.”*

### Example 1



### Example 2



**Step 1** – Give each student a blank piece of paper and something to write with.

**Step 2** – Ask the students to draw how they believe their agriculture program is divided or portioned.

**Step 3** – Count the activity as a participation grade.

**Step 4** - Have the students write down their responses to the following on an exit ticket:

- What is premier leadership?
- What is career success?
- What is personal growth?



# ENTREPRENEUR

DEFINITION: A PERSON WHO ORGANIZES AND MANAGES ANY ENTERPRISE, ESPECIALLY A BUSINESS, USUALLY WITH CONSIDERABLE INITIATIVE AND RISK.

- Qualities:

- Business focused
- Confidence
- Creative thinker
- Delegator
- Determination
- Independent
- Knowledge-seeker
- Promoter
- Relationship-builder
- Risk-taker



## AGRICULTURE REFLECTION QUESTIONS

Write the following questions on a piece of paper:

1. What need do you see in the agricultural industry?
2. What type of product could be developed as a solution to this need?
3. What qualities does the man in the video possess that contributes to his success?



# 12 EMERGING AGRICULTURE TECHNOLOGIES THAT ARE CHANGING WORLD

BY: [MICHELL ZAPPA, POLICY HORIZONS CANADA](#)

MAY 5, 2014



## DRONES

- **Crop sensors:** Instead of prescribing field fertilization before application, high-resolution crop sensors inform application equipment of correct amounts needed. Optical sensors or drones are able to identify crop health across the field (for example, by using infra-red light).



## SENSORS

- **Air & soil sensors:** Fundamental additions to the automated farm, these sensors would enable a real time understanding of current farm, forest or body of water conditions.
- **GPS (Global Positioning Systems)** – are being used for farm planning, field mapping, soil sampling, tractor guidance, crop scouting, variable rate applications, and yield mapping. GPS allows farmers to work during low visibility field conditions such as rain, dust, fog, and darkness.







## SENSORS CONT.

- **FitBits for Livestock: Collars with GPS, RFID and biometrics can automatically identify and relay vital information about the livestock in real time.**
- **Infrastructural health sensors: Can be used for monitoring vibrations and material conditions in buildings, bridges, factories, farms and other infrastructure. Coupled with an intelligent network, such sensors could feed crucial information back to maintenance crews or robots.**



## ENGINEERING

- **Vertical farming: A natural extension of urban agriculture, vertical farms would cultivate plant or animal life within dedicated or mixed-use skyscrapers in urban settings.** Using techniques similar to glass houses, vertical farms could augment natural light using energy-efficient lighting. The advantages are numerous, including year-round crop production, protection from weather, support urban food autonomy and reduced transport costs.





## FOOD

- **Genetically Modified Organisms (GMO's):** The creation of entirely new strains of food animals and plants in order to better address biological and physiological needs.
- **There are currently 10 GMO Crops:** Corn, Squash, Soybeans, Cotton, Papaya, Canola, Alfalfa, Sugar Beets, Potatoes, and Apples.
- **In-vitro meat:** Also known as cultured meat or tube steak, it is a flesh product that has never been part of a complete, living animal. Several current research projects are growing in vitro meat experimentally, although no meat has yet been produced for public consumption.





## AUTOMATION

- **Variable rate swath control:** Building on existing geolocation technologies, future swath control could save on seed, minerals, fertilizer and herbicides by reducing overlapping inputs. By pre-computing the shape of the field where the inputs are to be used, and by understanding the relative productivity of different areas of the field, tractors or agbots can procedurally apply inputs at variable rates throughout the field.
- **Artificial Insemination and Embryo Transfer Breeding:** The next generation of selective breeding where the end-result is analyzed quantitatively and improvements are suggested algorithmically.



## AUTOMATIONS CONT.

- **Agricultural robots: Also known as agbots, these are used to automate agricultural processes, such as harvesting, fruit picking, ploughing, soil maintenance, weeding, planting, irrigation, etc.**
- **Precision agriculture: Farming management based on observing (and responding to) intra-field variations. With satellite imagery and advanced sensors, farmers can optimize returns on inputs while preserving resources at ever larger scales. Further understanding of crop variability, geolocated weather data and precise sensors should allow improved automated decision-making and complementary planting techniques.**





## FOLLOW-UP DISCUSSION QUESTIONS

- How long does it take a water droplet to complete the water cycle?
- How are Drones used to benefit agriculture?
- Are there tractors that can drive themselves without someone inside them?
- What are your thoughts on Lab Grown Meat?

# RESOURCES

- GMO's - <https://gmoanswers.com/current-gmo-crops>
- GPS - <https://www.gps.gov/applications/agriculture/>
- News Article - <https://www.businessinsider.com/15-emerging-agriculture-technologies-2014-4>



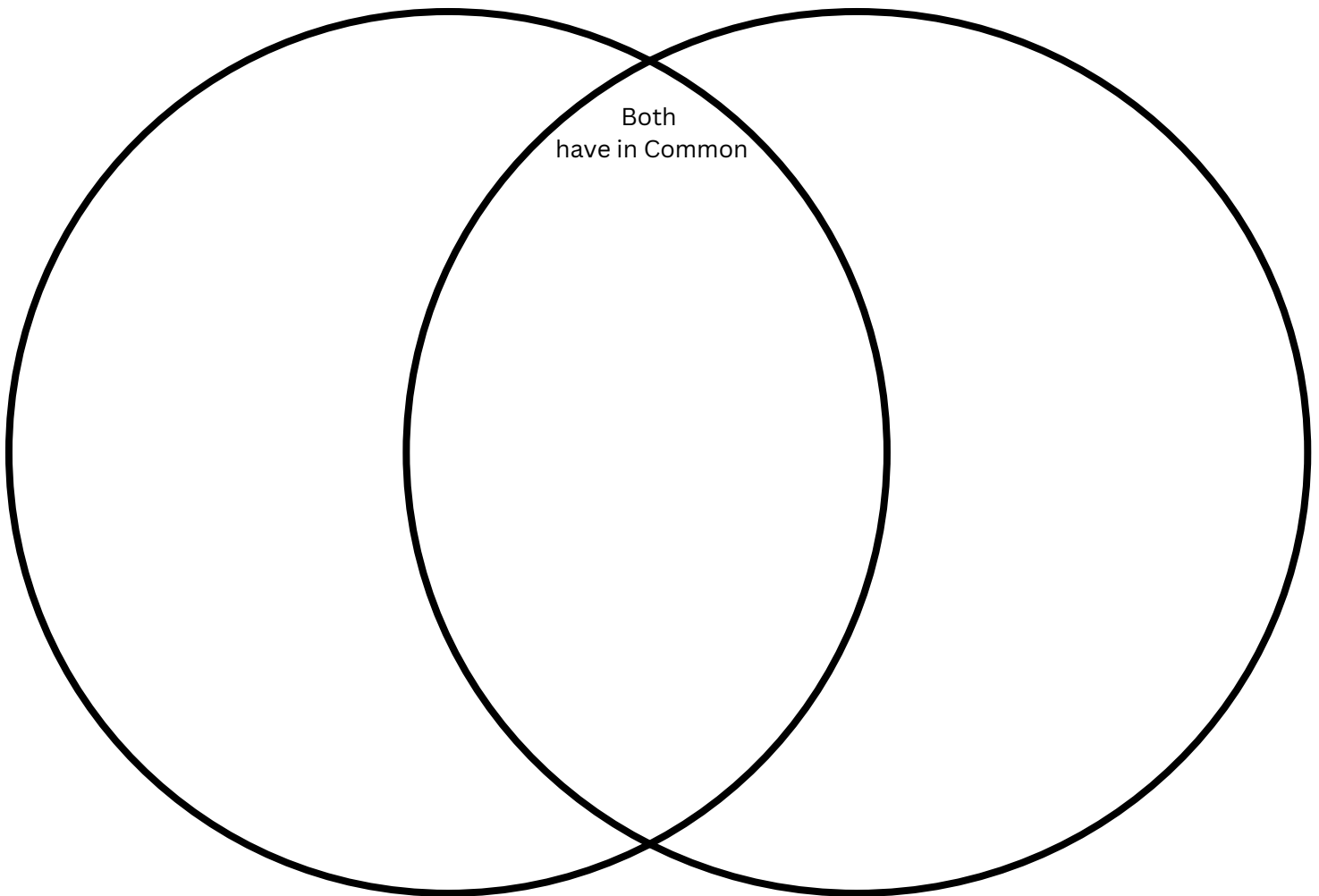


## Growing Our Future Podcast – Episode 15 & 16 Comparison Vs. Contrast Venn Diagram

**Overview:** Venn Diagrams can help you quickly and efficiently compare and contrast two or more ideas or subjects. A Venn Diagram is two overlapping circles, one circle for each subject you are comparing. In the central area where they overlap, list the traits the two items have in common.

Podcast  
Topic: \_\_\_\_\_

Podcast  
Topic: \_\_\_\_\_



### Instructions:

1. Write the name of the podcast video above each circle.
2. List attributes or points of each video/podcast in their circle.
3. Place any shared points in the overlapping section.
4. Be specific, clear, and concise, using details.
5. Answer the "Discussion Questions" on the back on a separate piece of paper.





## Growing Our Future Podcast – Episodes 15 & 16 Podcast Comparison Video Links

Name of Video	Motivational Video Link
<b>Episode 15 - The Value of Agricultural Science Education</b>	<a href="https://www.youtube.com/watch?v=C3PoFZLYNngo&amp;t=130s">https://www.youtube.com/watch?v=C3PoFZLYNngo&amp;t=130s</a>
<b>Growing Our Future - Agriculture, Food, and Natural Resources</b>	<a href="https://www.youtube.com/watch?v=lpKAxNLZrFc">https://www.youtube.com/watch?v=lpKAxNLZrFc</a>

### Discussion Questions:

1. What is the mission and history of the Agriculture Teachers Association of Texas (ATAT)?
2. What makes agricultural educators unique, and how can they be supported?
3. What are the agricultural science options offered to public school students in Texas?
4. How does agricultural education and participation in FFA prepare students for the future?
5. How many CTE's are there in the State of Texas?
6. How many courses are there in the Agricultural Food and Natural Resources Program?
7. What are TEKS (Texas Essential Knowledge and Skills)?
8. Why do CTE courses get weighted funding?
9. How many Certified Technical Student Organizations (CTSOs) are there in Texas?
10. Why are Supervised Agriculture Experiences (SAE) important?
11. What separates Agricultural Science and CTE students from other students?



## Growing Our Future Podcast – Episodes 15 & 16

### Podcast Comparison Video Links

### Discussion Questions KEY

#### Discussion Questions:

1. What is the mission and history of the Agriculture Teachers Association of Texas (ATAT)?

• **Answers:**

- **Mission** - The ATAT is a professional organization for ag science teachers and supporters that informs members about the latest ag ed practices, encourages higher standards of teaching and provides a unified voice in the state legislature.
- **History** - On August 9, 1940, representatives from each area in Texas met in College Station during the state in-service training meeting. The result of this meeting was the formation of the Vocational Agriculture Teachers Association of Texas. The Vocational Agriculture Teachers Association of Texas was established to promote and advance agriculture education in Texas and provide legislative representation to safeguard agriculture education programs.

2. What makes agricultural educators unique, and how can they be supported?

• **Answers:**

- Texas offers six programs of study under the Agriculture, Food, and Natural Resources career cluster: Agribusiness, Animal Science, Plant Science, Applied Agricultural Engineering, Food Science, and Environmental Science. Within each program of study, there are 5-7 courses. The range of offerings means that agricultural educators must be well-versed in everything from floral design to swine to agricultural metal structures. Furthermore, Alejandro points out teachers must keep up with "growing populations, urban sprawl, pests, wildlife, and more to be able to share the most contemporary information with students." As part of its professional development programming, the ATAT offers an annual conference offering everything from "pesticide certification to tours of a hatchery."
- The many facets of the job can be daunting, Pieniasek says, which is why the ATAT's mentorship program, an initiative that pairs retired agricultural educators with new teachers, has been so successful. "We're able to pay retired ag teachers to go into schools and get with first or second-year ag teachers to provide that mental and moral support as they navigate their way through a school system", Pieniasek says.



## Growing Our Future Podcast – Episodes 15 & 16

### Podcast Comparison Video Links

### Discussion Questions KEY

#### Discussion Questions:

3. What are the agricultural science options offered to public school students in Texas?

- **Answers:**

- §130.1 Implementation of Texas Essential Knowledge and Skills for Agriculture, Food, and Natural Resources, Adopted 2015
- §130.2 Principles of Agriculture, Food, and Natural Resources (One Credit), Adopted 2015
- §130.3 Professional Standards in Agribusiness (One-Half Credit), Adopted 2015
- §130.4 Agribusiness Management and Marketing (One Credit), Adopted 2015
- §130.5 Mathematical Applications in Agriculture, Food, and Natural Resources (One Credit), Adopted 2015
- §130.6 Equine Science (One-Half Credit), Adopted 2015
- §130.7 Livestock Production (One Credit), Adopted 2015
- §130.8 Small Animal Management (One-Half Credit), Adopted 2015
- §130.9 Veterinary Medical Applications (One Credit), Adopted 2015
- §130.10 Advanced Animal Science (One Credit), Adopted 2015
- §130.11 Energy and Natural Resource Technology (One Credit), Adopted 2015
- §130.12 Advanced Energy and Natural Resource Technology (One Credit), Adopted 2015
- §130.15 Food Technology and Safety (One Credit), Adopted 2015
- §130.16 Food Processing (One Credit), Adopted 2015
- §130.17 Wildlife, Fisheries, and Ecology Management (One Credit), Adopted 2015
- §130.18 Forestry and Woodland Ecosystems (One Credit), Adopted 2015
- §130.19 Range Ecology and Management (One Credit), Adopted 2015
- §130.20 Floral Design (One Credit), Adopted 2015
- §130.21 Landscape Design and Management (One-Half Credit), Adopted 2015
- §130.22 Turf Grass Management (One-Half Credit), Adopted 2015
- §130.23 Horticultural Science (One Credit), Adopted 2015
- §130.24 Greenhouse Operation and Production (One Credit), Adopted 2015
- §130.25 Advanced Plant and Soil Science (One Credit), Adopted 2015



## Growing Our Future Podcast – Episodes 15 & 16

### Podcast Comparison Video Links

### Discussion Questions KEY

#### Discussion Questions:

§130.26 Agricultural Mechanics and Metal Technologies (One Credit), Adopted 2015

§130.27 Agricultural Structures Design and Fabrication (One Credit), Adopted 2015

§130.28 Agricultural Equipment Design and Fabrication (One Credit), Adopted 2015

§130.29 Agricultural Power Systems (Two Credits), Adopted 2015

§130.30 Agricultural Laboratory and Field Experience (One Credit), Adopted 2015

§130.31 Practicum in Agriculture, Food, and Natural Resources (Two Credits), Adopted 2015

§130.32 Extended Practicum in Agriculture, Food, and Natural Resources (One Credit), Adopted 2015

4. How does agricultural education and participation in FFA prepare students for the future?

• **Answers:**

- Alejandro and Pieniazek agree that investing in agricultural educators creates more opportunities for participating students. "We know that in the state of Texas these students graduate at a higher rate than their peers. They go to college at a higher rate than their peers. They finish college at a higher rate than their peers," Alejandro says.
- Pieniazek points out that while agriculture science education produces great leaders in the agricultural sector, its reach goes far beyond. The "soft skills" learned in the ag science classroom and in FFA, such as public speaking, leadership strategies, and collaboration, prepare students to become doctors, lawyers, and accountants as well. "We are preparing them for those situations where they're going to make a difference in the lives of someone else," Pieniazek says.

5. How many CTE's are there in the State of Texas?

- **Answer:** 14 CTE Programs of Study. 6 Pathways under AFNR.

6. How many courses are there in the Agricultural Food and Natural Resources Program?

- **Answer:** 49 Courses, including the Practicum Courses.

7. What are TEKS (Texas Essential Knowledge and Skills)?

- **Answer:** TEKS are revised once every eight years, adopted by the State Board of Education (SBOE), and then implemented in schools by our teachers. The current standards outline "what students are to learn in each course or grade." The State Board of Education (SBOE) adopts the standards after extensive input from educators and industry stakeholders.



## Growing Our Future Podcast – Episodes 15 & 16

### Podcast Comparison Video Links

### Discussion Questions KEY

#### Discussion Questions:

8. Why do CTE courses get weighted funding?

- **Answer:** Two funding elements determine a district's total Career and Technology Education (CTE) allotment. School districts are eligible to receive weighted funding for eligible full-time equivalent (FTE) students in approved CTE programs. Districts receive 10 to 47 percent more funding for CTE full-time equivalent students than for regular students per methodology below.
- In addition to this weighted funding, school districts are also eligible to receive \$50 for each student in average daily attendance enrolled in a TEA-designated P-TECH (grades 9-12) or New Tech Network (grades 7-12) campus.

9. How many Certified Technical Student Organizations (CTSOs) are there in Texas?

- **Answer:** 9 CTSOs
  - Business Professionals of America (BPA) - Texas
  - DECA, Texas Association
  - Future Business Leaders of America (FBLA) - Texas
  - Family, Career and Community Leaders of America (FCCLA)
  - Health Occupations Students of America (HOSA)
  - SkillsUSA Texas
  - Texas Association of Future Educators
  - Texas FFA Association
  - Texas Technology Students Association (TSA)

10. Why are Supervised Agriculture Experiences (SAE) important?

- **Answers:**
  - The Supervised Agricultural Experience (SAE) program involves practical agricultural activities performed by students outside of scheduled classroom and laboratory time. SAEs provide a method in agricultural education for students to receive real-world career experiences in an area of agriculture that they are most interested in. Supervised Agricultural Experiences are an important component of agricultural education and are required element of all Agriculture, Food and Natural Resources (AFNR) courses as explained by the Texas Administrative Code.



**Growing Our Future Podcast – Episodes 15 & 16**  
**Podcast Comparison Video Links**  
**Discussion Questions KEY**

**Discussion Questions:**

11. What separates Agricultural Science and CTE students from other students?

- **Answer:**

- According to Hudson, the CTE agriculture program is “Making sure that every student has an opportunity to do what they want to do once they leave school [high].” Students gain the skills to move on into post-secondary education or have the ability to begin their career. He added that “It is a huge win for everybody.”



**Growing Our Future Podcast – Episode 15 & 16**  
**Three-Circle Model\_Slips**

**Teacher Instructions:** Cut the following topics out into slips. Cut out multiple slip sets for groups or one set for the whole class.

**Leadership / FFA**

**Classroom/Laboratory**

**Instruction**

**Supervised Agricultural**

**Experience**

**Product Research**

**Product Development**

**Product Pitch**

**Outdoor Classroom**

**Hands on Learning**

**Greenhouse Labs**

**Soup Making Lab**

**Plastic Making Lab**

**Egg Lab**

**Ice Cream and Butter Lab**

**Peanut Butter Lab**

**Exploratory “Research”**

**Placement “Working for**

**Someone”**



# **Entrepreneurship “Creating Your Own Business”**

**Job Shadowing**

**Working in a Community**

**Garden**

**Showing Livestock**

**Science Fair Project**

**Teaching Others**

**Growing Your Own Plants**

**Career Development**

**Community Service**

**Leadership Development**  
**Camps**  
**Conventions**  
**Conferences/Workshops**  
**Meeting New People**  
**Team Building**  
**Traveling**