

Spring 2021

## Horticulture curriculum for a school based agricultural classroom

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### Recommended Citation

Garland, Hannah, "Horticulture curriculum for a school based agricultural classroom" (2021). *Creative Components*. 738.

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**Horticulture Curriculum for a School Based Agricultural Classroom**

**High School**

**18 Week Curriculum**

**By**

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Spring 2021

A creative component submitted to the graduate faculty in partial fulfillment of the requirements

for the degree of:

Master of Science

Major: Agricultural Education

Program of Study Committee:

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## Chapter 1: Introduction

Introducing students to all aspects of agriculture, including horticulture, is becoming increasingly relevant, as we seek to feed more than nine billion people by 2050, while less than two percent of American are involved in agriculture (Strange, 2015). Where districts have agricultural programs, the emphasis is on row crops and animals. This information became prevalent when I enrolled in the agricultural education program and interacted with other future agricultural educators. These students either come from an agricultural background that was row crop and/or some form of livestock, or the student came from no farming background whatsoever. In either of these scenarios, there was an information gap between horticulture and other agricultural subjects. The purpose of this project was to create a curriculum that would be an option for future agricultural educators to use to increase their knowledge and understanding of the horticultural field and careers. Since many students will be coming into agriculture classes with prior knowledge of livestock and farm crops/agronomy or no agricultural knowledge whatsoever, their horticultural knowledge may be lacking.

This project focuses on creating a series of lesson plans to be taught at the secondary level and involves four major components. These components include Plant Anatomy, Plant Identification, and Plant Propagation. Within these overarching topics, units have been broken down into individual lessons over each area. The lesson plans start with plant anatomy to give the students a basic platform to build on for their understanding of future topics. Understanding basics of plant morphology will help form a better understanding of plant identification. Learning structures of plants through identification and anatomy lessons will aid students in understanding how plant features affect techniques of propagation. Completion of this

curriculum will develop a balance between students' prior knowledge of agriculture and their new understanding of agriculture.

## Chapter 2: Literature Review

Agricultural literacy is extremely important to the field of horticulture because everybody eats. “An agriculturally literate person understands how the agricultural industry works- not just where food comes from, but who grows it, agriculture’s effect on the economy, environment, technology, lifestyle and its relationship to livestock” (AFBA, 2019). While it is important for people to understand the biological differences between a bull and a steer, it is also important for people to understand what horticulture is and why someone would want to study it. The hands-on approaches agricultural education uses with learning by doing increases student intelligence (Luckey et al, 2013).

Agricultural education provides the opportunity for students to gain hands-on experiences which develop skills that can be applied to the food industry. Agricultural education provides students with the knowledge needed to create a world with no food insecurity. When agricultural educators use the psychomotor domain of Bloom’s Taxonomy they can guide the application by the students to allow students to effectively participate in meeting the food security and nutrition agenda. In the study done by Njura et al. students said they wanted more practical application to develop practical skills and real-world experiences. The majority of information that is covered through lectures and note taking should also be experienced through laboratories and projects (Njura et al, 2020).

“Experiential learning is an important pedagogical approach used in secondary agricultural education” (Baker and Robinson, 2016). The American education system is under pressure to increase academic achievement by students and there is a movement to change the way students learn. One of the ways that may be how students learn in the future is experiential learning. In

agriculture, students spend a majority of their time learning by doing. The agricultural classroom uses a blended approach of direct instruction and experiential learning to teach students. Students learn the basic information needed to identify a plant, judge a set of cattle, or learn the different soil horizons through direct instruction before applying their knowledge in experiential learning settings (Baker & Robinson, 2016).

In the study on the importance of horticulture perceptions, researchers found that the subjects agreed horticulture is extremely important and often misunderstood because, “it helps protect the ecosystem and environment, provides visual aesthetics and places of tranquility to urban areas, helps with conservation, produces food, and connects people to the earth and environment” (Pritts et al, 2016). Horticulture is particularly important to the agricultural field because of what it provides to humans, specifically in the forms of beauty, enjoyment and mental health. Horticulture is used in multiple entertainment venues in the form of turf. Sports are an important part of American culture and football, baseball, tennis, and soccer all need horticulturalists to maintain their playing surfaces. The green spaces in cities that are enjoyed by many are created and maintained by horticulturalists and horticultural therapy is a growing form of hospital and mental health treatment (Meyer et al, 2016).

### **Chapter 3: Methods & Procedures**

My goal was to create a comprehensive curriculum that would provide students the opportunity to gain a better understanding of the horticultural field. I first started with areas in horticulture that the lesson might cover. After some research, I decided the areas or units the lesson plans would include would be: the anatomy of a plant, proper methods of plant propagation, plant identification, and greenhouse management. Once I had decided on the units, I then began to look for content standards. For this project I used the Iowa Career and Technical Education Standards along with other resources to create an 18-week long curriculum for a semester class.

Next, I created the semester unit plan to have as a reference for what the semester would look like overall. This helped me to plan out how long each unit would be and to determine when exams should be scheduled. This also helped to guide the process since there was quite a bit of information I wanted to cover in a short period of time. From the unit plan I was able to create lesson plans, classwork, labs, and assessments. Each lesson is relatively unique and relates to the standards that are being met throughout the unit. The lessons have a variety of activities and assessments that allow students to engage in the lecture and laboratory. After creating a majority of the lesson plans a PowerPoint was created to help students understand the unit content through direct instruction. Lesson plans that didn't utilize a PowerPoint were for either a lab, experiential learning project, or an assessment. These lesson plans had the resources created to show what the students would be accomplishing. The curriculum was meant to help students gain a better understanding of the horticultural field.



## **Chapter 4: Product**

The Horticultural Lesson Plans for a School Based Agricultural Classroom is a set of lesson plans to be taught at the secondary level and involves four major units. These units include Plant Anatomy, Plant Identification, Plant Propagation, and Greenhouse Management. These units have been broken down into individual lessons for each area. The lesson plans start with plant anatomy to give the students a basic platform to build on for their understanding of future topics. Understanding the basics of plant morphology will help form a better understanding of plant identification. Learning structures of plants through identification and anatomy lessons will aid students in understanding how plant features affect techniques of propagation. The greenhouse will be utilized for propagation labs, which will allow students to have a basic understanding of the workings of a greenhouse before the unit on managing a greenhouse. The lessons are comprised of lectures, laboratories, and discussions to allow students to be engaged in all aspects of the learning process.

## Chapter 5: Reflection

The Horticultural Lesson Plans for a School Based Agricultural Classroom focuses on creating a series of lesson plans to be taught at the secondary level and involves four major components. These components include Plant Anatomy, Plant Identification, and Plant Propagation. Within these overarching topics, units have been broken down into individual lessons over each area. The lesson plans start with plant anatomy to give the students a basic platform to build on for their understanding of future topics. Understanding basics of plant morphology will help form a better understanding of plant identification. Learning structures of plants through identification and anatomy lessons will aid students in understanding how plant features affect techniques of propagation.

The idea of creating a set of lesson plans for school-based agriculture at the secondary level came to me when I started to take agricultural education classes. I realized that the majority of students I was in class with seemed to either come from a farming background that was row crop and/or some form of livestock, or the student came from no farming background whatsoever. Since many students will be coming into agriculture classes with prior knowledge to livestock and farm crops/agronomy, their horticultural knowledge may be lacking. I decided I wanted to create a set of horticultural lesson plans that all students could benefit from. These lesson plans will allow me to share resources and expertise with school-based agriculture teachers whose strength may not lie in horticultural sciences. These lessons plans will also benefit the secondary students who will be taking the classes, giving them a broader view of the horticultural field, therefore providing them insight into another career opportunity within the agricultural industry. I also plan to utilize these lesson plans in my own classroom in the future.

As the daughter of an elementary school teacher, I have felt that I understand the “behind the scenes” work teachers do to prepare to teach a new lesson every day. While a goal of this project was to benefit and educate students, I have also gained knowledge of the curriculum process. I learned how to create a set of detailed lesson plans that anyone will be able to read and understand while also creating a resource for myself for the day I begin teaching. Through this process of writing curriculum, I realized that there is much more that goes into lesson planning than I ever could have realized. The courses taken at Iowa State, while helpful, still don’t necessarily prepare you for the amount of work it takes to create lesson plans.

The Agriculture Education Master’s program at Iowa State University has given me insight and perspective into my teaching philosophy. This program contained courses that will help me understand how adolescents think, act, and react. This program has also made me more aware of what an agricultural classroom is like in 2020. Even though I have only been out of high school for four years there have been changes in the classroom because of current events in the world. Some of the courses taken through this program taught me more about social justice issues, special education, and integration of technology into the classroom. The agricultural courses in this program have prepared me for the agricultural classroom by providing the basic foundations of school based agricultural education from its history to the various organizations in the field. This program has prepared me for the classroom with various teaching methods and lesson plan creation following the Iowa teaching standards and the opportunity to teach those lessons in front of an audience of my peers. Overall, I feel confident that I am prepared for student teaching this coming spring and for a successful career in agricultural education.

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