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### Updating youth programming to meet needs of urban schools

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## **Abstract**

Sedgwick County, Kansas is home to the largest school district in the state of Kansas, USD 259-Wichita Public Schools. The county is also home to several suburban and rural school districts. Because of the urban-rural continuum present in the county, many students have very little experience with hands on plant science, gardening, or agriculture while other students are exposed to those concepts daily. K-State Research & Extension - Sedgwick County Master Gardener volunteers have been providing 4-H plant science school enrichment lessons for over 15 years as a way to engage the next generation in plant science, gardening and agriculture. These lessons were popular with teachers and volunteers, but the lessons did not meet the new Common Core / Next Generation Science Standards. Over a period of three years, requests by teachers had dropped by half. Also, teaching methods of the volunteers did not meet the expectations of modern students and teachers for hands-on and interactive learning. At the same time, interest in school gardens and school gardening programs has increased in our urban schools, but the programs were not prepared to meet that need for programming. Navigating the process of updating the lesson plans to meet the needs of urban schools, matching up with the science standards, improving hands-on learning, enriching the exposure of students to plant science, and engaging passionate volunteers in program delivery was long and difficult, but shows signs of good results.

## **Keywords**

plant science, education, volunteers, gardening, science standards, hands-on learning

# Updating youth programming to meet needs of urban schools

## Abstract

Sedgwick County, Kansas is home to the largest school district in the state of Kansas, USD 259-Wichita Public Schools. The county is also home to several suburban and rural school districts. Because of the urban-rural continuum present in the county, many students have very little experience with hands on plant science, gardening, or agriculture while other students are exposed to those concepts daily. K-State Research & Extension - Sedgwick County Master Gardener volunteers have been providing 4-H plant science school enrichment lessons for over 15 years as a way to engage the next generation in plant science, gardening and agriculture. These lessons were popular with teachers and volunteers, but the lessons did not meet the new Common Core / Next Generation Science Standards. Over a period of three years, requests by teachers had dropped by half. Also, teaching methods of the volunteers did not meet the expectations of modern students and teachers for hands-on and interactive learning. At the same time, interest in school gardens and school gardening programs has increased in our urban schools, but the programs were not prepared to meet that need for programming. Navigating the process of updating the lesson plans to meet the needs of urban schools, matching up with the science standards, improving hands-on learning, enriching the exposure of students to plant science, and engaging passionate volunteers in program delivery was long and difficult, but shows signs of good results.

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## INTRODUCTION

The K-State Research & Extension-Sedgwick County Master Gardener volunteers have been providing 4-H plant science school enrichment lessons for over 15 years. The volunteers present the lessons in the classroom in teams of three to five people. When the lessons were first developed, in the early to mid-2000s, many of the volunteers were retired teachers and worked hard to align the lessons with the current science standards. By the 2012-2013 school year, the volunteers were serving about 1,500 students per year with these presentations. Programs offered were Mystery Within Seeds (Gr K-1), Plantscapes (Gr 2-3), and Soils & Water (Gr 3-5).

In 2014, the state and local schools adopted the Common Core and Next Generation Science Standards. In addition, USD-259 (Wichita) adopted a new structure for their scope & sequence of curriculum throughout the district. This change meant that all elementary teachers at all schools in the district would be teaching the same subjects the exact same week. While there was some flexibility built into the system, there was not as much flexibility as in the past. This change was designed to address the needs of students and families that were highly transient and may be switching schools frequently during the school year.

Internally, the program transitioned to an online request system that caused some challenges for us. A subset of staff and volunteers were opposed to the new standards and not interested in changing programs, in part because the retired teachers had not taught under the Common Core standards nor the new USD 259 system. A number of the volunteers providing the presentations were very attached to the existing programs and methods, resulting in additional resistance to making changes.

By 2017, the program was serving only about 750 students each year. The majority of these program requests were from teachers serving more privileged schools, primarily non-USD 259, that

had more flexibility and that had also used our programs in the past. It was clear that it was necessary to update the program offerings to align with standards while keeping volunteers engaged and excited. It was also necessary to all the volunteers the opportunity to grieve their losses and adjust to the changed programs.

## **MATERIALS AND METHODS**

Due to the changes in the volunteer pool and the complexity of the new standards, it was necessary for staff to initiate the changes needed. After researching the new standards, in particular the Life Sciences standards in the Next Generation Science Standards (NGSS), staff gave a presentation to the program volunteers showing the discrepancies between the existing presentations and the topics needed for the standards at the various grade levels. It was important to assure volunteers that it was not a situation that what they had been doing was bad or wrong, just that it did not fit the needs of teachers and the curriculum.

Volunteers also received training and insights from experts about current methods in teaching, especially in teaching science as inquiry and using hands-on methods rather than lectures as primary teaching tools.

After getting a copy of the USD 259 Scope & Sequence from a school curriculum coach, staff and volunteers worked together to correlate when each of the the life sciences standards were being taught, and what grades and science standards were of interest to the volunteers. It also helped to move the process along by identifying where parts of the previous presentations might still be included. This was important to the volunteers as part of the grieving process and validating their prior work.

Ultimately, volunteers chose to work on developing new lesson plans for 1<sup>st</sup>, 2<sup>nd</sup>, and 5<sup>th</sup> grades. Volunteers then chose which, if any, of the lesson plan subcommittees they wanted to work on. Staff created 3-4 possible lesson plans for each grade level in order to give the volunteers a place to start. This allowed for sufficient staff oversight in starting the process off in the right direction. It also allowed the volunteers to choose between a variety of activities for each lesson plan, giving them some agency and control. They could choose to keep elements of the old lessons or replace them with new elements.

After volunteers had finished developing the new presentations and collected the materials needed to give them, it was time to practice. First volunteers gave the presentations to groups of volunteers to test the timing and flow of the presentations. Then some 4-H youth were recruited to participate in small practice presentations. These activities allowed for fine-tuning of the presentations.

At this point, staff and volunteers determined that the 5<sup>th</sup> grade lesson plan, while providing good information, did not truly meet the NGSS that were targeted, resulting in lower quality. It was determined to table that presentation and focus on the 1<sup>st</sup> and 2<sup>nd</sup> grade presentations.

From that point, the two presentations were finalized and two classrooms were recruited for initial presentations. Then the programs were promoted, starting in January 2019.

## **DISCUSSION**

### **Presentation 1**

The 1<sup>st</sup> grade lesson was entitled, "Plant Explorations." This lesson focused on two life sciences standards. 1-LS1-2: Read texts and use media to determine patterns in behavior of parents and offspring that help offspring survive. 2-LS3-1: Make observations to construct an evidence-

based account that young plants are like but not exactly like their parents. It also included a social studies standard/theme: change – As we grow we change and things around us change.

The elements of the lesson included a plant parts activity with diagram and labels, an activity where the students identified parts of the plant we eat, reading the book *A Fruit is a Suitcase for Seeds* (Richards, 2006), dissecting a bean seed and discussing the parts and roles of the seed, and planting bean seeds of different colors to start a Seed Science Investigation for on-going classroom observation. The plant part, seed dissection, and seed planting were carry-overs from old presentations, although done in a different way.

This presentation proved very popular in the first year. However, volunteers were overwhelmed by the amount of activity in the time allotted for the presentation and were not enthusiastic about continuing with it.

After reviewing the standards and discussing as a group, it was determined to do the plant parts activity as a whole classroom group to allow other volunteers to set up and prepare for small group work, alleviating some of the stress. The activity about identifying parts of the plant we eat was also eliminated. It did not directly meet any standard and was a challenge for many students. These changes also allowed for more freedom for the volunteers and students to discuss elements of the book that interested them and related to them. The Seed Science Investigation page was simplified and only one was completed per small group rather than by each student. Volunteers also had the flexibility to fill out the page themselves while talking with the students if it was determined that the reading and writing abilities of the children in the group were not equal to the task in the time allotted.

## **Presentation 2**

The 2<sup>nd</sup> grade lesson was entitled “Exploring Pollination through Creativity.” This lesson focused on one life science standard and one writing standard. 2-LS2-2: Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants. W.2.3: Write narratives in which they recount a well-elaborated event or short sequence of events, include details to describe actions, thoughts, and feelings. It also included a social studies theme: no two relationships are exactly the same.

The elements of the lesson included an introduction where students related the work of pollinators to the presence (or imagined absence) of common snacks or foods. Then students viewed a short video, *The Beauty of Pollination*, and discussed what they saw in the video. After that, students were assigned to small groups where they worked with a volunteer to learn more about one specific type of pollinator and what types of flowers or plants it prefers using pre-curated media (photos, videos) on provided tablets. The volunteer assisted the students in writing a short story or skit that was then acted out for the entire class with provided props and costumes.

This presentation was planned to take a slightly longer period of time than the 1<sup>st</sup> grade lesson, which was a change for the volunteers. However, the fun and excitement of this presentation mitigated the length for both the volunteers and the students.

Because this presentation was completely new and different from what we had done in the past, it was not adopted as quickly by teachers, especially in the first year. Requests were showing signs of increasing markedly in the second year.

## **CONCLUSION**

Because of the topics, most schools in our area tend to teach these standards in the spring. In the fall of the 2019-2020 school year, a few classes were recruited to test out the re-revised programs to make sure the volunteers were prepared for spring. These tests showed that the

revisions were successful. The program had over 30 requests scheduled for Spring 2020, and the volunteers had started giving those presentations to rave reviews from mid-February through March 10<sup>th</sup>. The number of requests had just reached the point where it was necessary to shut down the system due to volunteer availability. The volunteers had also started to develop plans for a 3<sup>rd</sup> grade lesson that would cover topics usually taught in the fall months. Unfortunately, all these activities were put on hold by the pandemic. Most of the local schools are not allowing visitors for presentations this fall, so the future of this program remains to be seen.

It was clear from the evaluations provided by the teachers that they were very pleased with the quality and content of the provided programs. Because of the demands on the time of the teachers and the requirements of the standards, hands-on activities that incorporate topics and themes from a wide range of subjects are necessary. Incorporating elements of reading, writing, math, and social studies increases the value of these enrichment presentations to busy teachers and to the learning of their students.

While the entire process took the better part of two years from the identification of the problem to the implementation of the new presentations, the collaborative work ensured that the final product would be something that served both the needs of the schools but was also enthusiastically embraced by the volunteers that give the presentations.

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