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Cultivating leaders: A school garden curriculum for elementary and high school partnerships

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Cultivating leaders: A school garden curriculum for elementary and high school partnerships

by

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in partial fulfillment of the requirements for the degree of

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Program of Study Committee:
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The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this creative component. The Graduate College will ensure this thesis is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University

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CHAPTER 1. INTRODUCTION

Agricultural literacy continues to be a hot-button issue in the agricultural industry. As we see consumers spending more time learning about their products and how they are produced, we tend to also see a gap in the understanding of those practices. Part of this literacy gap could be closed with the introduction to agriculture lessons at a younger age. Many agricultural education students, parents, agriculture teachers, and industry leaders believe that agricultural education provides a context-rich environment that facilitates this venue (Bellah and Dyer, 2009). While some organizations, like Farm Bureau, have incorporated lessons into the elementary classrooms, the gap continues. Agriculturally literate adolescents are able to “a) engage in social conversation, b) evaluate the validity of media, c) identify local, national, and international issues, and d) pose and evaluate arguments based on scientific evidence” as it relates to “agriculture, food, fiber, and natural resource systems” (Graves, Hughes, & Balgopal, 2016). How can we get consumers to learn about their products in an educational way? Will starting these lessons at a younger age improve their understanding and knowledge?

The West Fork Community School District stretches over a geographical area of three hundred and fourteen square miles split between Franklin and Cerro Gordo counties in north central Iowa. It is home to 704 students pre-Kindergarten through twelfth grades. The Sheffield campus is home to both elementary school and high school students, serving grades pre-kindergarten through first grades at the elementary and ninth through twelfth grades in the high school. In the summer of

2017, the district was invited to partake in the Healthy Harvest of North Iowa's quarterly meeting to discuss the opportunities for our local school districts to procure locally grown produce to incorporate into the hot lunch programs. After attending preliminary meetings the district, along with Cerro Gordo Public Health, Mason City Community Schools, and the Hampton-Dumont/CAL Community School District, agreed to proceed with writing a grant proposal for the Farm to School Program. Meanwhile, the Agricultural Department at West Fork Community Schools designed and constructed two; one hundred-twenty square foot raised garden beds. The school's vision was to aid in the procurement of local produce, while providing educational opportunities for its students. The garden area will be utilized within the school district to produce food for the lunch program at the Sheffield campus, along with provide learning opportunities for the students attending there. In December of 2017, the grant was submitted and the organizations received word during the summer of 2018 of the successful grant proposal. The funding received from the grant would go toward the research and development of the Farm to School grant the following year. The school districts divided their parties into three different teams; the Leadership Team, Procurement Team, and the Educational Sub-Team. The West Fork district created a committee to oversee the school garden and work of the grant and designated the "Team Green Thumb" to its committee members. The committee attends different professional development opportunities, writes grants to secure funding for the garden's future, and completes the planning and maintenance of the garden area. Our district's goal is to let all students, regardless of age, learn through the use of the raised bed gardens. Due to the large

age gap of our student body at the Sheffield campus, a collaborative curriculum is in high demand.

CHAPTER 2. LITERATURE REVIEW

At what age should we teach our children about where their food, fibers, and fuels come from? At what age will they understand the importance of these processes? Piaget (1961) suggests children go through different stages of cognitive development. The elementary aged students of West Fork are primarily in the Preoperational Stage of cognitive development; meaning students are increasing at an extraordinary rate in their mental representation. While this is true in regards to language development and egocentrism, studies suggest children don't enter into the Concrete Operational Stage of development until age seven (Piaget, 1961).

In Hess and Trexler's study, they found the agricultural literacy of young children to be lacking. The children in the study were entering fourth and fifth grade. The questions asked were based on K-5 benchmarks, and additional questions were developed based on a student's response to the questions. All initial questions were based on the dissection of a cheeseburger. While many of the students understood what different parts of a cheeseburger were made of, many didn't understand the processes it takes to make those parts or where they come from. In fact, much of the knowledge they had came from personal experiences with gardening. Others took knowledge from what they had heard. In one instance, a child perceived pickles to come from lions, simply because her mother and grandmother told her so. Would they have benefited from taking some sort of agriculture coursework earlier on to solidify their knowledge?

Bandura (1994) suggests people learn from experiences by building their own self-efficacy. There are four main sources of influence including mastery experiences, vicarious experiences provided by social models, social persuasion, and to reduce people's stress reactions and alter their negative emotional proclivities and misinterpretations of their physical states (Bandura, 1994). Beliefs of personal efficacy can influence the types of activities and environments a person may choose, which could influence the types of lives people live. Because of the choices they might make, people can develop different abilities, hobbies, and relationships.

Studies also show educators believe it is important to integrate agriculture into the elementary and middle school classrooms. In a study by Knobloch, Ball, and Allen (2007), teachers believed their students should be educated in the areas of conservation and the environment, food production, and the importance of agriculture to students' lives. Teachers in this study acknowledged that agriculture provided the contexts to discuss and apply the content they taught to their students (Knobloch, Ball, & Allen, 2007). Agriculture connects many subject areas, and in some cases provides a real life example of how we use them in every day life. Science, math, and geography are great examples of different subjects used in agriculture on a daily basis. By integrating these concepts into curriculum, the students at West Fork may also see the importance of their education.

Generating mentorships to create positive experiences that foster self-efficacy in youth is extremely important. The West Fork Agriculture Department will utilize a spin off of the Partners in Active Learning Support (PALS) program to create these

relationships between elementary and high school students. Mentoring activities will center around building trust and developing positive self-esteem through sharing and working together in a one-to-one relationship (National FFA Organization, 2018). To create a successful learning environment, the curriculum utilizes Bandura's findings, along with the mentorship guidelines associated with the PALS program to foster educational lessons in agricultural literacy, particularly in gardening, to create a positive learning experience.

CHAPTER 3. METHODS AND PROCEDURES

The focus of this curriculum is to involve both high school and elementary students in a school-wide raised garden bed project. The lessons cover basic plant care from seed maturity and should be taught alongside the growing cycles of the garden beginning in March. Since the elementary school houses kindergarten and first grades at West Fork, a rotation will be used to ensure each grade level sees a complete cycle from planting to harvest in the gardens. The high school students in the Plant Science and Agronomy courses will align to this cycle.

Although there are particular curriculums focused for older youth, such as Iowa State University Extension's "Growing in the Garden", none were geared toward a high school and kindergarten partnership. This coursework combines both principals from Growing in the Garden and the Partners in Active Learning Support (PALS) approach.

Partners in Active Learning Support (PALS) is a mentoring program designed by the National FFA Organization. The curriculum is designed to partner high school and elementary students who may need extra support with their education, self-esteem, and the spark their excitement about agriculture (National FFA, 2018). With the proximity of the students to each other at the Sheffield Campus, this approach will allow for stronger relationships between students as well as increase student confidence among elementary students.

General outlines from the Growing in the Garden curriculum were compared with grade level standards and benchmarks, and adjusted accordingly. Collaboration with both kindergarten and first grade teachers ensured the content was going to be a good fit based on presumed background knowledge of those students entering into these grade levels. Activities taken from the PALS program were also reviewed and adjusted accordingly. A curriculum was already in place for high school students in the area of Plant Science, however a “mentor’s sheet” was created for each lesson to ensure the proper procedures were followed for high school/elementary partnership activities.

Time will be allotted for each high school student to complete the activity as a group prior to completion with the kindergarten students. This protocol is for high school mentors to gain confidence in completing the activity with their mentees, along with creating an opportunity for questions if they arise. Their success with the lessons will also build their self-efficacy as we finish the school year.

CHAPTER 4. PRODUCT

A collaborative curriculum for high school and elementary students was created. The curriculum covers different lessons in planting, maintenance, harvesting, and processing horticultural crops. The curriculum will be used in various points of the school year, where high school students will connect with elementary students to assist in tasks required of the garden, as well as work on developing relationships with younger students in our district.

Each lesson is designed to include standards and benchmarks, an interest approach, lesson outlines, and activities to be done outside in the garden area. There are separated lessons for elementary and high school students, respectively being taught within their age levels. The activities are designed for both age groups collectively.

This curriculum is designed on a rotation so each student sees a growing cycle from start to finish. The structure of the curriculum allows for flexibility to accommodate for teacher schedules, along with school schedules, as weather and unanticipated events occur. Upon completion of the designated curriculum, there may be time for extensions of some of the lessons, especially around the harvest time frame. These extensions could be designed based on school needs and interests. Examples of these may include processing, canning and proper storage, along with creating meals using the produce.

CURRICULUM

Lesson 1: Seeds

Objective: Identify the characteristics of seeds and why we use them

Subject Standards: Science- K-LS1-1 Use observations to describe patterns of what plants and animals (including humans) need to survive.

Materials Needed:

- Samples of different seeds
- *Surprise Garden* by Zoe Hall
- Larger variety of seeds for sorting (Petunia, corn, sunflowers, soybeans, rice)
- Buckets (to hold the seed at each station)
- Magnifying glasses (for each station)
- Dixie Cups (for each station)
- Egg Cartons (2 per station)
- *How a Seed Grows* by Helene Jordan
- Eggshells (1 per student)
- "Care for your Egghead" (1 per student)
- Permanent Markers
- Potting Soil
- Grass Seed
- Teaspoon

Anticipatory Set: "Seeds are nearly everywhere! You'll find seeds in almost every fruit, like an apple. You'll find the little brown seeds in the center. If you eat a peach, you'll find a hard pit in the center. If you look under some trees, you'll find acorns, or walnuts. Flowers have seeds too!

What are some other things you can think of that have seeds?"

(Wait for student responses)

Seeds are quite amazing! They push through the soil to grow into a plant, which will produce even MORE seeds! Some seeds can produce a lot of food like tomatoes or apples, some can produce many flowers. Let's read about some more about characteristics of seeds.

(read Surprise Garden book)

Where were the seeds planted?

In the soil

What did the seeds need to grow?

Sun, soil, water, and air

What tasty things grew from seeds in their surprise garden?

Peas, beans, squash, spinach, lettuce, broccoli, cauliflower, carrots, radishes, watermelon, and sunflowers.

Where do the seeds come from?

From the fruit after the flowers go away.

*Learning stations should be set up ahead of time with the seeds in buckets, two egg cartons, and a magnifying glass. Students should scoop a few seeds into the egg cartons to look at while at the stations.

What characteristics do you see when looking at the seeds?

Size, shape, color

What characteristics did you feel when you touched the seeds?

Rough, smooth, ridges

When you looked at the seeds under your magnifying glass, what did you see that you didn't see before?

Seeds can be round or pointed, smooth or rough, shiny or dull. They come in a lot of different colors, some seeds are striped or spotted.

Reflection:

What do all of the seeds have in common?

They come from plants and will grow into new plants

Are seeds living or nonliving?

Living

Why are they considered to be living?

After they take up water, they grow.

Can you think of any seeds that we eat?

Peas, beans, corn, rice, sunflower seeds.

Apply:

“Let's use some grass seeds to grow hair on our eggheads using eggshells as pots”

Using a teaspoon, have an adult or high school student fill the eggshell with potting soil. Have the students lightly pack the soil into the shell and add a little water. Put 1 teaspoon of grass seed on top of the soil. Water the seeds lightly with a gentle stream of water so that the seeds don't wash out of the eggshell. Put the eggheads in egg cartons and set them on a tray or seedling flat. You may want to put the tray in a large plastic bag (like a Ziploc or bread bag) and seal it. Set next to a window or

under grow lights if available. Check it daily and remove the plastic as soon as you see signs of growth. Within four to five days you should see "hair" on the eggheads. They can take them home after they have sufficient growth and send along the "Care for your Egghead" instruction sheet.

What did you just do?

Planted seeds and grew a plant

What will the seeds need in order to grow?

Water and light

What can you do to help them grow?

Water them (but not too much), and give them sunlight

Lesson 2: Germination

Objective: Identify simple parts of a seed, Describe how seeds grow, list reasons seed germination is important to students and others.

Subject Standards: Science- Life (characteristics of organisms, life cycles of organisms, organisms and environments) Social Studies- Individual development and identity Math-K.MD.A.1; Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.

Materials:

- *A Seed Is a Promise* by Claire Merrill
- Dry lima beans (2 per student)
- Container or Ziploc bag
- Germination Record activity sheet
- Egg Cartons (1 per group of 3 students)
- Potting soil
- Plastic Spoon
- Disposable plastic plate (4 per group)
- Garden bean seeds
- 3 different varieties of green bean seeds
- Pen/Pencil
- Ruler
- Paper towels
- 3 clear plastic gallon-sized bags

Anticipatory Set: *Read *A Seed is a Promise*

“Raise your hand if you ever promised something to someone....what are some of the promises you’ve made? What did you have to do to keep the promise? Could you keep it? Why or why not?”

What is the definition of a promise?

“An agreement to do or not to do something”

How is a seed a promise and what kind of promise can they make to farmers?

If seeds are given the right conditions of sun, water, soil, and air, they promise to try to grow into the plant they came from. Seeds assure us that the species of that plant will continue on. Their promises are that they will grow and produce crops if other factors or forces don’t interfere. Farms and gardeners can use the crops to feed their families.

Can it take a long time for a promise to be fulfilled?

Yes, it might take an oak tree a few months to germinate and nearly twenty years before it is large enough to provide much shade or produce any acorns.

“Take a close look at your bean seed. The clear “skin” on the outside of the seed is called the seed coat. It is stuck tight to the seed when it’s dry and serves as a protective covering for the baby plant. When the seed coat softens in moist soil or water, it allows water into the seed, enabling the seed to begin growing. The seed coat may be thing like on the bean, or really thick like a coconut. Where is the seed coat on your paper? Let’s draw an arrow to it”

“The two large pieces are called the cotyledons. They are sometimes called the “seed leaves” because they were part of the seed. In some plants, they are the first leaves to emerge from the soil. Some plants, such as corn, have seeds with only one cotyledon. Other plants, like beans, have two. The cotyledons are the stored food for the young plant until it starts making its own food. Let’s draw a line to the cotyledon on your drawing”

“The chlorophyll in the cotyledons starts working, causing them to turn green. On the inside curve of the bean seed, you will see a tiny plant called the embryo. The embryo has a root, stem, and leaves. Draw the embryo on your seed picture and label the root, stem, and leaves.”

“When water is present, the seed coat will soften, and the water will soak into the cotyledons. The embryo soaks up some of the water and starts to grow. The root is the first part of the embryo to grow. It stretches out and pushed is way through the softened seed coat. The stem and leaves of the embryo then push out of the seed coat and grow up. The cotyledons on some plants, such as beans, grow about the oil. They stay in the soil on other plants such as corn.”

Activity: Divide the class into groups of three with one high school student in each group. Give each group an egg carton and twelve bean seeds. Have the students scoop potting soil into the cells of the egg carton and plant one bean seed ½ inch deep into each cell. With a pencil have them number the cells on the lid from cartons in a location that receives bright light. Two days after planting, have the students predict what the seeds will look like. Then have students use plastic spoons to carefully dig up the seeds in the two cells labeled 1, put the seeds on a plastic plate, and look at them. Record the findings on the Class Growth Chart. Four days after planting, dig up the seeds in Row 2 and record you findings. Repeat the process on days six, eight, ten, and twelve. Plot the results on the overhead document “Bean Growth Graph” as a class.

Did the seeds change in size after 2 days?

Yes

What was the first part of the plant to break out of the seed?

The root

Lesson 3: Planting the Garden Seeds

Objective: Use prior knowledge to plant seeds for the school garden beds.

Standards: PS.01.02. Prepare and manage growing media for use in plant systems.

Materials:

- Seedling flats and trays (2 per station)
- Seed packets (tomato, pepper, onion, broccoli, etc)
- Potting soil
- Watering cans
- Pencils per station
- Garden markers
- Permanent Marker

Activity: High school students will get into groups with their elementary PALS to plant the seeds to be used for the West Fork School Gardens. Students will follow the mentor sheet to successfully complete the activity.

1. Obtain needed materials for the seed planting
2. Measure enough potting soil to fill the seedling trays flush to the top.
3. Have elementary students use the end of a pencil to create a divot in the potting soil per cell.
4. Students should place one seed per divot.
5. Lightly cover the seed with potting soil
6. Gently water the tray using the watering can
7. The high school student should write using a permanent marker which seed they were assigned on a garden marker. Place marker in the seedling flat and place in the designated are in the greenhouse.
8. Periodically check on the seedlings with the students until time for transplant.

Lesson 4: Parts of a Plant

Objective: Identify the four main parts of a plant.

Standards: PS.02.02. Apply knowledge of plant anatomy and the functions associated with plant systems.

Materials:

- “Parts of a Plant” sheet
- Examples of plants brought from greenhouse
- Pen/Pencil

Anticipatory Set:

What are some of your body parts?

Head, arms, legs, etc.

Why do we have certain parts of our body?

They do stuff for us!

What are some parts of a plant?

(Student responses)

Activity:

“Today we’re going to talk about the different parts of plants, why they have those parts, and what they need to grow”

Plants have 4 parts. Looking at your worksheet, can anyone tell me the different parts you see?

(Responses may vary, but roots, stems, leaves, fruits)

Let’s look at the roots. The roots job is to soak up **water** and nutrients from the soil to use it to feed to the plants.

The next part is the stem. The stem is the sturdy stalk that helps the leaves get as much sun as possible. The stem also brings water up from the roots, and carries the plants sugars from the leaves down to the roots to store for later use.

One of the most important parts are the leaves. They are the food making machines that use the water and nutrients from the roots to make sugars that feed the plant. They do this through a process called photosynthesis. They also breathe in carbon dioxide, and breathe out oxygen. It’s kind of the opposite of what we do, where we breathe oxygen in and carbon dioxide out.

The last part of a plant we’re going to talk about are the fruits. The fruit of a plant contains seeds. Seeds are what we grow new plants with, but sometimes we can eat the fruit. What are some fruits that we eat? (apples, oranges, peaches, etc). If you were to plant the seeds from those fruits, you could grow a new plant! Go ahead and

see if you can find the different parts on your worksheet!

Reflection:

Why do plants have stems?

Because that's how they stand up, kind of like our bones.

Why do plants have roots?

So they can drink water and give the plant nutrients

Why do plants have leaves?

To soak up all the sunlight so it can make its food

Why do plants have flowers?

So they can grow into the fruits we eat or the seeds they need to grow new plants

Lesson 5: Transplanting to a Garden Bed

Objective: Successfully transplant onion seedlings to a raised garden bed.

Materials:

- Onion seedlings
- Garden trowel
- Gardening gloves
- Garden Markers

Activity:

*Ahead of time, the designated teacher will need to go out and mark out the area to be planted in the raised garden bed.

High school students will take their respective seedlings to the garden beds and help elementary students obtain a pair of gardening gloves.

1. Groups of students will take their onion seedlings to the designated area.
2. High school students will help elementary students by modeling how to dig a proper hole for the seedling, how to place the seedling in the hole, and how to cover the seedling with soil.
3. Elementary students will continue to plant the remaining seedlings in the raised garden beds.
4. Students will then water the seedlings
5. Students will pick up and organize the seedling flats, return gloves to the bin, trowels to the bin, and proceed to wash up at the restroom.

Reflection:

Why is it important do you think to plant the onions into the garden bed? Why can't they stay in their flats?

Because they'll get too big for the flats and will have much more room to grow

How long will it be until we can harvest our onions?

Lesson 6: Planning Our Gardens

Objective: Students will collaboratively create a plan for the order and arrangement of planting in a raised garden bed for tomatoes, peppers, onions, etc.

Materials:

- Salsa and Herb Garden plan
- Garden Journal Folders

Activity:

What are two things do we need to do when planning our garden?

-Figure out how big the garden will be

-What will we plant and how much will we plant?

What two steps are included in our folders?

-How big our garden is

-How much we're going to plant

How wide is our garden?

-4 Foot

How long is our garden?

-20 Foot

How many squares with dark outlines are in our rows going across the garden?

4- can you find the number 4 along the border of the garden?

How many boxes are going up and down on our garden?

20- can you find the number 20 along the border of our garden?

If there are 4 boxes and our garden is 4 feet wide, what does each box represent?

1 foot.

With your high schoolers, lets figure out what we can plant and how many!

*Students will use the mentor sheet to help their elementary pals figure up the total amount on their garden sheet.

Reflection:

How many tomatoes can we plant in our garden?

Students will come up with their answer

How many Peppers can we plant in our garden?

Students will come up with their answer

How many onions are already planted in our garden?

21

How about herbs like Cilantro?

4 rows of 3 foot planted directly into the ground.

Lesson 7: Planting Our Seedlings

Objective: Students will plant the garden seedlings according to their developed plan.

Standards: PS.03.01. Demonstrate plant propagation techniques in plant system activities.

Materials:

- “Planning Our Garden” sheets
- Flats of tomato, pepper, broccoli, etc. seedlings.
- Gardening gloves
- Garden trowels

Activity:

*Ahead of time, the designated teacher will need to go out and mark out the area to be planted in the raised garden bed for each designated crop

High school students will take their respective seedlings to the garden beds and help elementary students obtain a pair of gardening gloves.

1. Groups of students will take their onion seedlings to the designated area.
2. High school students will help elementary students by modeling how to dig a proper hole for the seedling, how to place the seedling in the hole, and how to cover the seedling with soil.
3. Elementary students will continue to plant the remaining seedlings in the raised garden beds.
4. Students will then water the seedlings
5. Students will pick up and organize the seedling flats, return gloves to the bin, trowels to the bin, and proceed to wash up at the restroom.

Reflection:

Was it easier this time around to plant your plants now that you’ve done it before?

Many should say yes

Were there any plants that were different to plant?

Cilantro should come up, but majority of the others should be fairly similar

The next time you guys meet up with us, you’ll be first graders! Then we can harvest our plants, and then we can eat them!

Lesson 8: Harvesting our Crops

Objective: Students will successfully harvest remaining crops from the raised garden beds based on ripeness.

Standards: PS. 03.05. Harvest, handle, and store crops according to current industry standards.

Materials:

- Receptacles for produce
- Pruning shears (just in case)

Anticipatory Set:

Welcome back! What did we do the last time we got together at our garden?

We planted our plants

What do you think has happened since the last time you saw them?

Answers may vary. Students who live in town may have seen the progress over the summer months, others may not have seen them since they planted them.

Let's talk about what's happened since we planted our crops. They had all summer to grow big, and a lot of them have produced a TON of vegetables for us to pick! Your teachers came in and weeded the garden, and gave it water when it didn't rain enough, to make sure our plants grew big and strong. Are we ready to go out and pick our crop?

Activity: Students will listen to instructions from the teacher to talk about what ripe produce looks like.

1. High school students will direct elementary students to the raised garden bed areas they were assigned.
2. High school students will oversee the elementary students harvest of the garden beds, and will assist if they need help. They will ensure the produce is ready to be picked.
3. Students will place the harvest crop into proper receptacles, where they will be transported to the proper storage area for processing.

Reflection:

How cool was it to see your vegetables that have grown from tiny seeds?

(Student responses)

Why is it important to make sure our crops are ripe before we pick them?

They won't taste very good, and won't be very good to cook with.

What are some things we could make with our vegetables?

Salsa, spaghetti, broccoli and cheese, etc.

Lesson 9: Making Healthy Choices

Objective: Students will learn about the importance of vegetables in their daily diets.

Standards: 21.K-2.HL.4: Identify influences that affect personal health and the health of others.

Materials:

- “My Plate” sheet
- Chromebook
- Pen/Pencil

Anticipatory Set:

How many of you think you eat healthy?

(raise of hands)

What kinds of food do you eat to stay healthy?

Fruits, vegetables, meat, milk, etc.

How many of you like to eat your veggies?

(raise of hands)

Let’s take a look at what kinds of things we need to eat to be healthy, and what the vegetables in our garden do for us!

Activity: *All students will use a standard 2000 calorie diet for this activity.

1. Students should obtain a “My Plate” worksheet and partner off with their high school partners
2. High school students will go to <https://www.choosemyplate.gov/MyPlatePlan> using their Chromebook
3. Choose the “2000 calorie” tab for the 4-8 year old range.
4. Explore the different types of foods and how much you should eat around your plate. Pick food that your elementary buddy likes to eat.
5. Have the elementary students draw the foods, and in what quantity they need to eat them, on their plate using the “My Plate” worksheet.
6. When finished drawing their plate, close the Chromebooks and come back to the circle for reflection

Reflection:

What were some of the foods you need to eat to get big and strong?

Fruits, veggies, grains, proteins, dairy

What should you eat the most of on your plate?

Veggies

What are some of the veggies you guys put on your plate?

(Student responses)

How many of you had vegetables we grew in the garden this summer?

Student responses

Next time is our last time getting together. We will be using our vegetables to make something yummy using the vegetables we grew!

Lesson 10: Creating a Recipe from our Garden

Objective: Create salsa using different produce the students have raised from seed.

Standards: FPP.01.02. Apply food safety and sanitation procedures in the h products to ensure food quality.

21.K-2.HL.4: Identify influences that affect personal health and the health of others.

Materials:

- *Summer Salsa* recipe (1 per station)
- Tomato, jalapeño pepper, onion, cilantro, garlic, lime
- White corn chips
- Small paper plates
- Spoon
- Assorted kitchenware (found in FCS classroom)
- Rubber gloves

Anticipatory Set:

Raise your hand if you like salsa? What is salsa?

Salsa is the Spanish word for sauce. It's made with a bunch of different ingredients, and can be cooked or made fresh. Usually it's eaten with chips, but can be used as a topping for eggs, tacos, salads, etc. It's even more popular than KETCHUP!

What "My Plate" group do you think salsa falls under?

Vegetables

Let's make some salsa!

Activity:

*High school students should be the only ones operating knives! Teachers should supervise the different stations and know where proper safety equipment is located.

Allergies to particular foods need to be made aware prior to this activity!!!

Note: Have onions and garlic chopped and limes cut in half prior to the activity.

1. All students should wash their hands with soap and warm water.
2. Seed and chop 5 medium tomatoes (be careful using the knives!) Add to a mixing bowl.
3. Seed and dice 1 jalapeño. Make sure to wear the gloves while doing this to avoid getting the juice on your hands. Add to the mixing bowl.
4. Gather $\frac{1}{4}$ cup of chopped onion, 1 Tbs of garlic, and 2 tablespoons of fresh cilantro. Add to the bowl.
5. Take 2 lime halves and squeeze the juice over the ingredients in the bowl. Add $\frac{1}{4}$ tsp salt and $\frac{1}{4}$ tsp black pepper to the bowl as well.
6. Have the elementary students mix the ingredients in the bowl using a spoon. Cover with plastic wrap and chill.

Reflection:

What vegetables did we use from our garden to make the salsa?

Peppers, tomatoes, onions

Why can't we grow limes in our garden?

We can't grow them in Iowa because it gets too cold

You guys will be able to eat your salsa at snack time. We've really enjoyed working with you, and appreciate your hard work you've done in the garden!

PALS MENTOR PACKET

ACTIVITY 1: EGGHEADS

1. The elementary students can draw a face on their egg if they want to using a permanent marker.
2. Using a teaspoon, have fill the eggshell with potting soil.
3. Have the students lightly pack the soil into the shell and add a little water.
4. Put 1 teaspoon of grass seed on top of the soil.
5. Water the seeds lightly with a gentle stream of water so that the seeds don't wash out of the eggshell.
6. Put the eggheads in egg cartons and set them on a tray or seedling flat.
7. Set next to a window or under grow lights if available.

ACTIVITY 2: GERMINATION

1. Each high school student should have 3 elementary students. This will be divided up after circle.
2. Grab an egg carton and twelve bean seeds from the materials table.
3. Have the elementary students scoop potting soil into the cells of the egg carton
4. Plant one bean seed $\frac{1}{2}$ inch deep into each cell (6 total).
5. With a pencil have them number the cells on the lid from cartons in a location that receives bright light.

ACTIVITY 3: PLANTING OUR SEEDS

1. Obtain needed materials for the seed planting
2. Measure enough potting soil to fill the seedling trays flush to the top.
3. Have elementary students use the end of a pencil to create a divot in the potting soil per cell.
4. Students should place one seed per divot.
5. Lightly cover the seed with potting soil
6. Gently water the tray using the watering can
7. The high school student should write using a permanent marker which seed they were assigned on a garden marker. Place marker in the seedling flat and place in the designated area in the greenhouse.

ACTIVITY 4: PARTS OF A PLANT

1. Make sure your pal gets a worksheet for "Parts of a Plant"
2. Follow along with them during the discussion
3. After the discussion, help them find the 4 parts of a plant. There should be roots, leaves, stems, and fruits.

ACTIVITY 5: TRANSPLANTING TO A GARDEN BED

1. Groups of students will take their onion seedlings to the designated area.
2. High school students will help elementary students by modeling how to dig a proper hole for the seedling, how to place the seedling in the hole, and how to cover the seedling with soil.
3. Elementary students will continue to plant the remaining seedlings in the raised garden beds. If a student is struggling, please help them!
4. Students will then water the seedlings
5. Students will pick up and organize the seedling flats, return gloves to the bin, trowels to the bin, and proceed to wash up at the restroom.

ACTIVITY 6: PLANNING OUR GARDEN

1. Make sure your student has their Garden Folder with the Garden Planning sheet in it!
2. Using your chromebook, figure up what the growing requirements are for your designated plant (tomatoes, broccoli, onions, peppers, cilantro, etc.)
3. Shade in with a pencil the amount of space where you'll plant your plants.
4. Put their garden plans back into their folders! You will need these for next time's activity.

ACTIVITY 7: PLANTING OUR SEEDLINGS

1. Groups of students will take their onion seedlings to the designated area.
2. High school students will help elementary students by modeling how to dig a proper hole for the seedling, how to place the seedling in the hole, and how to cover the seedling with soil.
3. Elementary students will continue to plant the remaining seedlings in the raised garden beds. If a student is struggling, please help them!
4. Students will then water the seedlings
5. Students will pick up and organize the seedling flats, return gloves to the bin, trowels to the bin, and proceed to wash up at the restroom.

ACTIVITY 8: HARVESTING OUR CROPS

1. High school students will direct elementary students to the raised garden bed areas they were assigned.
2. High school students will oversee the elementary students harvest of the garden beds, and will assist if they need help. They will ensure the produce is ready to be picked. **MAKE SURE THEY'RE PICKING RIPE VEGETABLES!!!**
3. Students will place the harvest crop into proper receptacles, where they will be transported to the proper storage area for processing.
4. After dropping off our pals, we will transport the buckets to the high school kitchen for Coleen to wash/etc.

ACTIVITY 9: MAKING HEALTHY CHOICES

1. Students should obtain a “My Plate” worksheet and partner off with their high school partners
2. High school students will go to <https://www.choosemyplate.gov/MyPlatePlan> using their Chromebook
3. Choose the “2000 calorie” tab for the 4-8 year old range.
4. Explore the different types of foods and how much you should eat around your plate. Pick food that your elementary buddy likes to eat.
5. Have the elementary students draw the foods, and in what quantity they need to eat them, on their plate using the “My Plate” worksheet.
6. When finished drawing their plate, close the Chromebooks and come back to the circle for reflection
7. BEFORE LEAVING: Remind your pal that the next time we meet it will be the last time we get together.

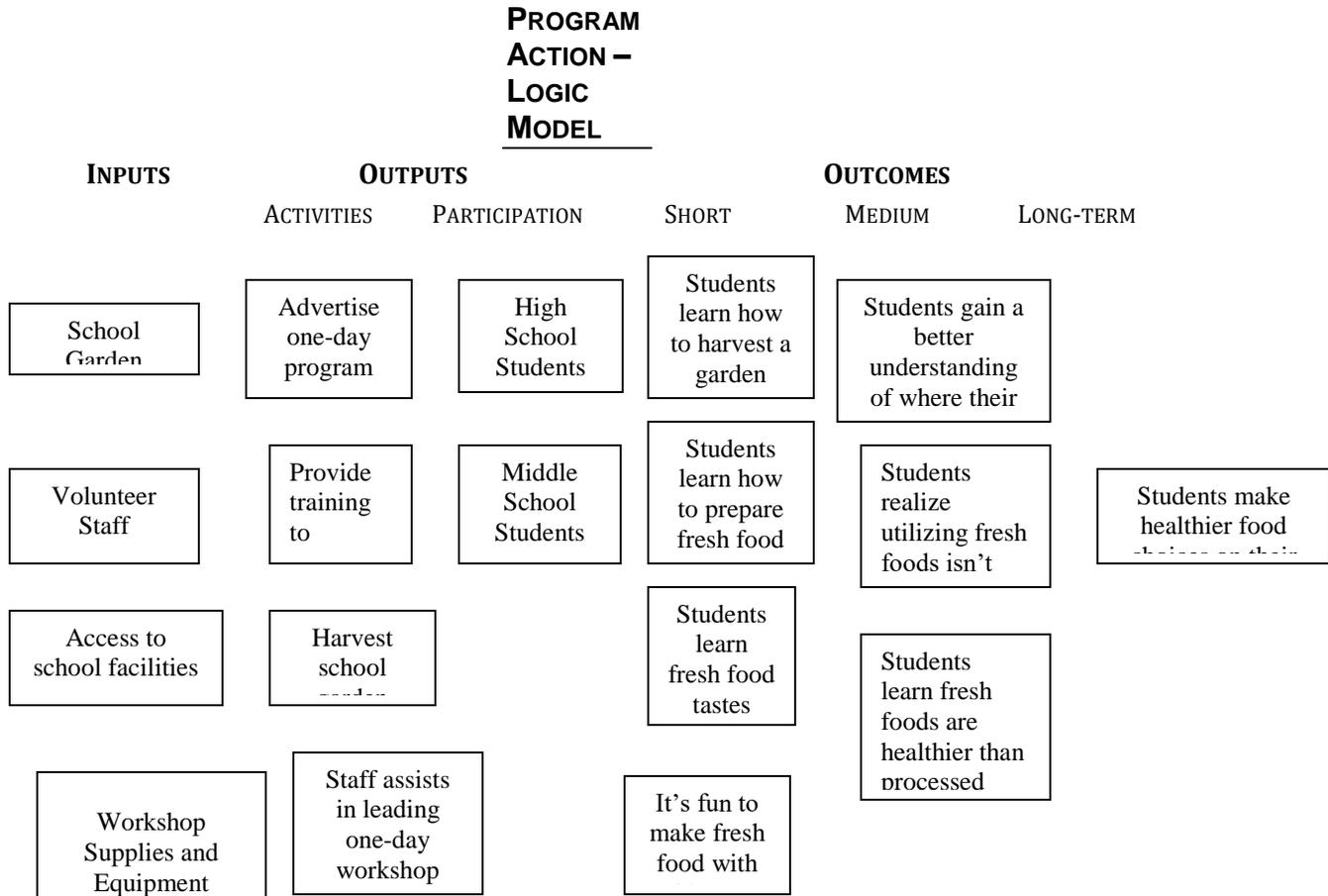
ACTIVITY 10: CREATING A RECIPE FROM OUR GARDEN

1. All students should wash their hands with soap and warm water. **THIS IS A MUST!**
2. Seed and chop 5 medium tomatoes (be careful using the knives!) Your elementary pal should NOT be using knives at all! Add to a mixing bowl.
3. Seed and dice 1 jalapeño. Make sure to wear the gloves while doing this to avoid getting the juice on your hands. Add to the mixing bowl.
4. Gather $\frac{1}{4}$ cup of chopped onion, 1 Tbs of garlic, and 2 tablespoons of fresh cilantro. Add to the bowl.
5. Take 2 lime halves and squeeze the juice over the ingredients in the bowl. Add $\frac{1}{4}$ tsp salt and $\frac{1}{4}$ tsp black pepper to the bowl as well.
6. Have the elementary students mix the ingredients in the bowl using a spoon. Cover with plastic wrap and chill.
7. Say goodbye to your pal. Chances are this will be a sad day, but remind them you’ll see them around school for the rest of the year.

Possible Extension:

SITUATION: EXPOSURE TO FRESH FOOD ENCOURAGES STUDENTS TO MAKE HEALTHY CHOICES, YET A STUDENT’S SOCIOECONOMIC STATUS MAY AFFECT THEIR ABILITY TO ACCESS AND ENJOY FRESH FOOD PRODUCTS.

PRIORITIES: PROVIDE AN EXPERIENCE FOR STUDENTS WHERE THEY HAVE ACCESS TO FRESH FOOD PRODUCTS.



EVALUATION

What do you want to know?

How will you know it?

Did the students have a positive experience through this program?

CHAPTER 5. REFLECTION

This curriculum will be a long-term tool at West Fork Community Schools, because it not only can be adapted to the needs of the industry and the school district, but also teaches students more than information. Unseen benefits to the curriculum include collaboration among grade levels and between grade levels, but also how to work as a team, which meets 21st Century Skills standards needed to graduate high school. By instilling these skills in children from a young age, we can extend their learning as they grow. This curriculum will also create background knowledge across an entire grade level when it comes time for other programs such as Ag in the Classroom. Often times when these programs come to schools, there are students who have agricultural experience and those who have none. Bridging the gap with general knowledge, particularly in gardening in plants, allows those programs such as Ag In the Classroom to focus on other facets or to extend the lessons they offer as all students will have the background knowledge needed in plant sciences.

I personally feel this tool would be helpful to any program that may plant seeds in a greenhouse or have a garden at their own school, because the collaboration between high school and elementary students is so important. This curriculum will undergo a series of critiques annually to accommodate particular classes on a given year, and as methods and regulations change within the industry. There is also an opportunity to gain different pieces of equipment, which could be

included into the curriculum as an extension. Plans for an orchard, aquaculture system, and high tunnel are all possible additions to the current garden area.

At the beginning of my graduate school journey I wasn't sure what to expect, or where I would fit the pieces of my coursework into my own program. Quickly after updating my teaching philosophy from my undergraduate studies, I began thinking about where I can serve my students in a greater capacity. When the opportunity arose with the school garden, I knew this was something that creating a curriculum would end up saving me time, as well as my coworkers who want to utilize the space for their students. Many of the courses I took, including my Children's Literature class, have helped in some capacity to mold this curriculum.

One of the main differences I've seen in my teaching is how I create my lessons and how they will be viewed from a student standpoint. The amount of outside literature I read now compared to the beginning of my graduate studies has increased as well, whether it is articles from the *Journal of Agricultural Education* or books on project-based learning. I've noticed a change in my openness to new experiences, including gaining my Artificial Insemination certificate, and listening to different viewpoints. One of the things I really enjoy about teaching is the collaboration between colleagues. Utilizing the discussion in my graduate coursework has also reminded me of the importance of collaboration among my students, which has trickled down into their coursework. I strongly believe my decision to complete graduate courses has refreshed my passion for learning, which has strongly affected my teaching.

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