Lesson Plans
PreK-12
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Lesson Plans
Early Care
Squash for Babies

Infants
Babies can participate in Farm to School month! Try these fun activities to promote vegetables and fruits, while meeting Georgia Early Learning and Development Standards (GELDS):

• **Explore different kinds of squash:** Babies can touch, grasp, and smell squash, engaging in both sensory (PDM4) and fine motor (PDM6) development. If you have access to a spiralizer, zucchini spirals would be a fun texture and shape to explore in a sensory bin or bag.

• **Incorporate vegetables and fruits into daily activities and play:** Read books, show pictures, and sing songs about different vegetables and fruits (CLL2, CLL5). Red Pepper Yellow Squash, Say and Play “Food”, Baby Let’s Eat, and My Very First Book of Food are examples of baby books.

• **Mealtime learning:** Say and repeat the names of foods being served, focusing on vegetables and fruits (CLL2).

• **Taste it:** Tips for incorporating squash into the infant menu (PDM2):
  › Serve pureed zucchini and squash for babies 6- about 8 months
  › Diced, steamed zucchini and squash are great finger foods for 8-9 months and up
  › Babies who are eating table food can enjoy squash mixed in pasta dishes, soups, casseroles, whole grain breakfast breads, or you can steam long strips for them to pick up and bite

Toddlers
There are so many fun ways to incorporate summer squash into lessons plans for toddlers! Try these activities to celebrate Farm to School month, while meeting Georgia Early Learning and Development Standards (GELDS):

• **Incorporate squash into morning circle time:**
  › Many “letters of the week” can incorporate Farm to School and squash, for example: E is for Eat, F is for Farm, G is for Garden, S is for Squash, P is for Plant, V is for Vegetable, Z is for Zucchini
  › Plan your color of the week or month to be yellow, so you can incorporate yellow squash

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• **Plan an indoor or outdoor scavenger hunt** for “things that are yellow”, and include yellow squash in the hunt *(APL3)*

• **Create a farm or garden sensory bin:** fill the bin with brown or wild rice and hide small plastic vegetables or vegetable erasers. You can also use corn kernels or birdseed, and hide farm animals or other farm-themed items. *(PDM4)*

• **Make art with squash:** *(CD-CR2)*
  - Trace sliced squash circles, or color pictures of squash
  - *Example 1*
  - *Example 2*
  - Use sliced zucchini or squash to stamp paint onto paper
  - [Create a zucchini racer](#)

• **Cook with squash:** Try these easy recipes that kids can help make: *(PDM2)*
  - Zucchini pizza bites- Kids can spoon pizza a tiny amount of sauce onto zucchini slices, and top with shredded mozzarella cheese. Spray a baking pan with cooking spray (or use foil and spray for easy clean up), and bake at 400 for about 8 minutes.
  - Vegetable Soup- kids can help add chopped or canned vegetables and broth into an unheated slow cooker. Cook soup on low, out of reach of children, for a few hours.
  - Salsa- add a little diced squash to your favorite salsa recipe. Children can help pour ingredients and stir.
  - “Zoodles”- if you have access to a spiralizer, show the kids how you can turn zucchini into noodles, or “zoodles.”
Using Your Senses to Observe Squash 4-5 year olds

Co-Created by: Monica Griffin, Registered Dietitian
Eleanor Walsh, Teacher, The Nest Nursery School

Overview
Students will use their five senses to learn about different types of squash. They will help prepare a nutritious squash snack.

Georgia Early Learning and Development Standards:
CD-SC1.4a Uses senses to observe, classify and learn about objects and environment.
CD-MA3.4b Compares objects using two or more attributes, such as length, weight and size.
PMD4.4a Discriminates between a variety of sights, smells, sounds, textures, and tastes.

Objectives:
• Students will identify squash as a plant and as food.
• Students will identify their five senses.
• Students will compare and contrast different types of squash.
• Students will review how they use their senses during mealtime.

Materials:
• A variety of types of squash, like zucchini, yellow squash, butternut squash, acorn squash, and pumpkin
• Knife and cutting board for cutting squash open
• Observation journals (or plain paper), crayons or pencils
• Vegetable instrument, or electronic device to play a video of the Vegetable Orchestra
• Raw zucchini or summer squash for tasting (with cheese if desired)
• Optional: Magnifying glasses or a microscope
Lesson Plan
Engage (whole group) | 10 MINUTES

Show the students a squash, or a few different types of squash. Ask the students “Do you know what this is?”

- Explain that squash starts as a seed in the ground, and grows into a plant we can eat. Squash belongs in the vegetable group (nutritionally, it is classified as a vegetable since we eat it like one. Botanically, it is a fruit because it grows from the flower of a plant. That may be more than you want to explain at this age!)

- Ask the students “Can you name our five senses?” Review the five senses: sight, smell, hear, taste and touch.

- Tell the students that we are going to use our senses to find out how different types of squash are the same and how they are different.

- Optional: Transition Song: The Five Senses Song
  (Sung to the tune of Head, Shoulders, Knees and Toes)
  Sight (point to your eyes)
  Smell (point to your nose)
  Taste (point to your mouth)
  And Touch (wiggle your fingers in the air)
  Taste and Touch
  (repeat)
  Don’t forget we hear with our ears (point to your ears)
  Sight, Smell, Taste and Touch, Taste and Touch
Using Your Senses to Observe Squash 4-5 year olds

Explore (small groups and at table) | 20 MINUTES

Smell:
• Have the students smell the squash and discuss.

Touch:
Allow the students to touch and hold the squash. Some may be bumpy, while others are smooth. Ask the students which is the heaviest, and the lightest. Demonstrate that summer squash, like zucchini and yellow squash, have thin, delicate skin, while winter squash have hard, thick skin. (you could choose to transition back to the whole group at this point, or stay in small groups)

Sight:
• Show the students different types of squash.
• Have the students report how the squash looks, for example, the color and shape. Ask the students which squash is the largest or longest, and which is the smallest or shortest. The students can draw the squash in an observation journal, or plain paper.
• Cut the squash open and show the inside. How does it look- is it a different color?
• Use magnifying glasses or a microscope to let students get a closer look!

Hear:
• Explain that some people make instruments out of vegetables. If you have access to an instrument made out of a squash or gourd, share it. You can also play this video that includes zucchini and pumpkin instruments,: https://www.youtube.com/watch?v=xM1EjIDLMLY

Taste:
• Explain that summer squash, like zucchini and yellow squash, can be eaten without cooking it. Allow the children to try raw zucchini or yellow squash slices. You could also serve the squash along with a piece of cheese, using the squash slice like you would a cracker.
Using Your Senses to Observe Squash 4-5 year olds

Explain (whole group) | 5 MINUTES

• Discuss how the different types of squash were the same (i.e. they all have seeds, they grow from the ground)
• Discuss how the different types of squash were different (i.e. different colors, sizes, textures, shapes)
• You could make a chart to document the similarities and differences

Extend (whole group) | 5-10 MINUTES

• Discuss how the students use their five senses during mealtime.
• Ask questions like:
  › Is there a food that looks so yummy, when you see it, you can’t wait to eat it?
  › Is there a food that smells really good to you?
  › Are there foods we eat with our hands instead of a spoon or fork?
  › Can you name a food that is so crunchy you can hear when someone takes a bite?
  › What is your favorite food to taste?
Zucchini Life Cycle 4-5 year olds

Co-Created by: Eleanor Walsh, Teacher, The Nest Nursery School
Monica Griffin, Dietitian

Georgia Early Learning and Development Standards
CLL1.3a Listens and responds to conversations and group discussions.
CD-SC1.3c Records observations through drawings or dictations with adult guidance.
CD-SC1.3d Participates in simple experiments and discusses scientific properties.
CD-SC4.3c Explores and identifies physical properties and states of matter of common classroom objects.

Materials
• Zucchini seeds
• Whole zucchinis
• Magnifying glasses
• Flashlights and examination lights
• Child-safe cutters
• Paper and drawing/writing materials
• Trowels
• Clay/play dough
• Unit blocks, lengths of string, rulers
• Paper towels
• Water
• Plastic bags
• Tape
• Camera
• Outdoor garden space
• Dirt

Duration
Two to three weeks, or long enough for seeds to sprout and fruits to visibly decay.

Motivation
Time-lapse video of growth and decay of a flower. Discuss what happened with the plant and how it changed. Discuss the concept of death in relation to plants, as a way of nourishing the earth again through decay.
Zucchini Life Cycle 4-5 year olds

Procedure

1. Have children observe the seeds. Encourage them to feel the seeds together, using magnifying glasses and lights. Provide cutters for opening the squash and examining it.

2. Provide materials for children to draw the seeds and squash. Encourage the children to use clay or play dough to replicate the shape of the squashes and the seeds. Provide unit materials such as unit blocks and rulers for comparing the size of the seeds and fruits. Have them trace the individual seeds and fruits for measurement.

3. Plant the seeds with wet towels and plastic bags, taping them to a sunny window.

4. At the same time tape a large bag with a whole zucchini to the window, sealed well. Do the same with one of the fruits the children cut up.

5. Assess the growth and decay daily, using drawings, clay, and magnifying glasses. Have the children take pictures daily for reference later. Open the decaying bag to smell it or touch the fruit with a chopstick.

6. Once the seeds have sprouted and the whole fruits have become desiccated, plant both in the outdoor garden. Discuss how the whole fruit will nourish the new seeds.

Conclusion/Assessment

Gather all the children’s pictures of the growth and decay process. Have the children look at the pictures and their drawings, remembering as a group the different stages and what the children noticed.

Extensions and Differentiation

Extensions: Watercolor opportunities with the colors from the documented stages of the growth and decay. Discuss death in the context of other things, like picking plants from outside or through pets that have passed.

Differentiation: Allow children who have trouble sitting and drawing or listening opportunities to paint with colors on a large piece of paper to facilitate large motor movement.
Zucchini Taste Test 4-5 year olds

Co-Created by: Monica Griffin, Dietitian
Eleanor Walsh, Teacher, The Nest Nursery School

Overview
Students will learn about squash

Georgia Early Learning and Development Standards:
PDM5.4b Demonstrates coordination and balance in a variety of activities.
PDM2.4a Helps prepare nutritious snacks and meals.
CD-MA2.4d Describes data from classroom graphs using numerical math language.

Objectives:
• Students will identify zucchini as a food that grows on the farm/garden.
• Students will help make a healthy snack to taste.
• Students will report if they “loved, liked or tried” the snack, then will describe the data from the classroom graph.

Materials:
• Taste Test handout (for teacher reference)
• Materials for zucchini recipe (if making zucchini pizza bites, find ingredients needed *here* link to recipe)
• Zucchini (ideally, one per small group table)
• Materials to make a graph: large paper and marker, chalkboard and chalk, etc.

Lesson Plan
Engage (whole group) | 15 MINUTES

• Ask the students “Where do our foods come from?”

• Explain that while we buy food from the grocery store, most of it was grown or raised on a farm. Ask the students to name foods that come from the farm (including vegetables, fruits, meats, eggs, dairy foods, etc.)

• Story in Motion: Visiting the Farm. Read the story below while you and the students act out the underlined movements.

  Today we’re going to visit the farm. Let’s climb the stairs onto the bus and buckle our seatbelt.

  We have arrived at the farm. We get off the bus, and meet the farmer. He says ‘it’s time to milk the cows, we better run (in place) fast to the barn.” We all get a turn to squat down and milk the cow.

  Now we visit the chickens. What sound do chickens make? Let’s walk and cluck like chickens. Does anyone see any eggs? Let’s pick the eggs up and put them in our basket.

  Next, we ride a tractor to the vegetable garden. The ride is bumpy, woah! First, we see cornstalks. Let’s reach up high to grab corn off the cornstalk. Then, we see carrots. Let’s bend down and pull the carrots from the ground.

  What is that? I see something growing on the ground. It’s green, and long, and looks yummy. What could it be? Zucchini! Let’s get on our hands and knees, and use our scissors (fingers) to cut the zucchini off the stem.

  Everybody slowly and carefully carry your zucchini to your table.
Zucchini Taste Test 4-5 year olds

Explore (small groups and at table) | 10-15 MINUTES

- Have the children help make a zucchini recipe, like Zucchini Pizza Bites
- (Transition back to the whole group as the recipe cooks)

Explain (whole group) | 10 MINUTES

- Explain that the class will soon get to taste their creation.
- Review and agree on rules for tasting new foods, for example:
  1. It’s your choice whether or not you try it. Trying new foods can be fun!
  2. You can explore your piece after it’s in your hand. You can smell it, touch it, and if you choose, taste it.
  3. Don’t “yuck my yum.” I’m sharing this food with you today because I really like it, so please don’t tell me it’s yucky.
- Allow the children to taste and explore their finished recipe.

Extend (whole group) | 10 MINUTES

- Create a graph and document how many kids “liked it”, “loved it”, or “tried it” (we encourage you to use ‘tried it’ instead of ‘didn’t like it”).
- Discuss how we all like different tastes, so sometimes one person really likes something, and another person doesn’t like it as much - and that’s OK!
- Share the recipe with the parents/families.

Photo: Food Network

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Overview
The class will read “Edible Colors” together to activate their prior knowledge about the different colors of food that they eat. Children will then echo-read poems about each color and participate in a sorting game where they will sort models or photos of fruits and vegetables by their color. Children will learn that the different colors help different parts of their body and they will color in those colors on an outline of a human body. Optional extensions are provided in which children can go on a color scavenger hunt in the garden, make a salad using fruits and vegetables of every color, or draw a shopping bag of fruits and vegetables of every color that they like to eat.

TIME NEEDED: 30 MINUTES + OPTIONAL EXTENSIONS)

Georgia Early Learning and Development Standards:
CD-MA4. Sort and classify
CD-SC5. Awareness of environment

Objectives:
• Children will be able to sort various fruits and vegetables to match the color cards.
• Children will be able to actively explore their environment to identify colors in the garden.
• Children will be able to depict or articulate that different colored foods are good for your body in different ways.

Materials:
• “Edible Colors” by Jennifer Vogel Bass
• Crayons

Reproducibles:
• Plant Parts Cards (Set 1, Set 2)
• Color Posters (1 set)
• Outline of Human Body (1 for each student)
• Garden Color Scavenger Hunt (1 for each student)
• Shopping Bag (1 for each student)
Edible Colors Pre-K
Jenna Mobley, Tending Our Common Ground

Outline:

• **Engage:** Read “Edible Colors”
• **Explore:** Complete edible colors relay and echo-read colors poem
• **Explain:** Learn the health benefits of different colored foods
• **Extend:** Taste a colorful salad, complete a garden color hunt, or draw your shopping basket

Lesson Plan

Engage (whole group / seated on the carpet) | 5 MINUTES
Read “Edible Colors” by Jennifer Vogel Bass and review the colors as you read. Also, connect to children’s personal eating experiences through discussion as familiar foods occur during the book.

Explore (whole group / moving on the carpet) | 10 MINUTES
Edible Colors Relay: Designate a certain area of the learning space for each color. As you place the color cards, review each color by echo reading the color poem for that color. Provide each child with the same number of fruits or vegetables of various colors. When you say “go” students can walk around the learning space to place their fruit or vegetable in the area designated for its color. When everyone has finished and returned to the whole group area, review each color again. Repeating the echo reading of the poem and showing the fruits and vegetables of that color.

Explain (whole group / at seats) | 15 MINUTES
Explain that the colors of fruits and vegetables are clues to the nutrients they hold that help different parts of our body. Travel to each group of colored fruits and veggies, this time explaining the health benefits of each. As each color is introduced, children will find the matching color crayon and shade in the body part that benefits from that color on the body outline provided.

- RED/ORANGE Good for your heart
- PURPLE/BLUE Good for your brain
- GREEN Good for your lungs
- WHITE Good for your bones
- YELLOW/ORANGE Good for your eyes

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Edible Colors Pre-K
Jenna Mobley, Tending Our Common Ground

Extend: Garden Extension (small groups / outside | 20 MINUTES)

Invite children to participate in a color scavenger hunt in the garden or outdoor space. With free time to explore, children are given a task to find something of each color that occurs in nature. Children can use the provided color scavenger hunt sheet or they can use paint chips to match the colors to what they see in the garden.

Other Optional Extensions

Kitchen Extension (whole group / seated on the carpet) - 20 minutes
Create a salad with fruits and vegetables from every color of the rainbow.

• RED Strawberries, red cabbage, red apples
• ORANGE / YELLOW Summer squash, carrots, mandolin oranges
• GREEN Zucchini, leafy greens, green apples
• BLUE / PURPLE Blueberries
  › This salad would be great with some crumbled blue cheese, nuts or granola, and a light drizzling of a sweet vinaigrette dressing.

Real-Life Connection (independent / in seats) | 15 MINUTES

Provide children with a drawing of a shopping bag to draw the fruits and veggies they would like to buy at the grocery store. Remind them to include a variety of colors to ensure that they are getting all of their nutrients. When they are finished, they can describe their choices to the teacher or the class.
## Evaluate

*Example Evaluation*

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Engage</strong></td>
<td>Child participated in listening to “Edible Colors” and contributed their personal eating experiences.</td>
<td>25</td>
</tr>
<tr>
<td><strong>Explore (CD-MA4.)</strong></td>
<td>Child participated in the Edible Colors relay activity by sorting and classifying foods by their color.</td>
<td>25</td>
</tr>
<tr>
<td><strong>Explain</strong></td>
<td>Child colored in their human body outline to match the body part that the teacher identified for each color.</td>
<td>25</td>
</tr>
<tr>
<td><strong>Extend (CD-SC5.)</strong></td>
<td>Child actively explored their environment to find plants of different colors.</td>
<td>25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
Plant Cards Set 1
Plant Cards Set 1

Oh My Squash!

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#ohmysquash
Plant Cards Set 1

Early Care
GA Standards

20 min

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Plant Cards Set 1

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Plant Cards Set 1

Oh My Squash!

[Images of blackberries and kale]

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Early Care  GA Standards  20 min
Plant Cards Set 2

[Images of melons and grapes]

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Plant Cards Set 2

Oh My Squash!

GA Standards 20 min

Plant Cards

Early Care

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Plant Cards Set 2

Oh My Squash!

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Early Care  GA Standards  20 min

#ohmysquash
Plant Cards Set 2

Oh My Squash!

Plant Cards Set 2

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Early Care  GA Standards  20 min
Plant Cards Set 2

Plate 1

Plate 2

Plate 3

Plate 4

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Plant Cards Set 2

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Plant Cards Set 2

KEY

Row 1 - Blueberries
Row 2 - Cucumber
Row 3 - Carrots
Row 4 - Tomatoes
Row 5 - Potatoes
Row 6 - Green Beans
Row 7 - Strawberries
Row 8 - Butternut squash
Row 9 - orange
Row 10 - pumpkin
Row 11 – zucchini
Row 12 – persimmons
Row 13 - peppers
Row 14 – eggplant
Row 15 – peaches
Row 16 – pineapple
Row 17 – blackberries
Row 18 – kale
Row 19 – cantaloupe
Row 20 – grapes
Row 21 – radish
Row 22 – onion
Row 23 – Brussel sprouts
Row 24 – asparagus
Row 25 – artichoke
Row 26 – kohlrabi
Row 27 – spinach
Row 28 – cauliflower
Row 19 – broccoli
Row 20 – corn

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Color Poem Posters

Red/Rojo

Red is an apple.
Red is a cherry.
Red is a rose.
And a ripe strawberry.

Yellow/Amarillo

Yellow is a lemon,
Butter and cheese,
Bananas and squash,
All healthy for me!

Orange/Naranja

Orange is an orange,
Orange is a carrot,
Orange is the color
Of the beak of a parrot.

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Color Poem Posters

Green/Verde

Bright green apples
Are bitter to the tongue
But spinach and broccoli-
I eat them up yum!

Blue/Azul

Blue is the ocean.
Blue is the sky.
Blue are the blueberries
I put into the pie.

Purple/Purpura

Purple are grapes.
Purple are plums.
Purple is a violet.
And the bruise on my thumb.
Shopping Bag

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GA Standards  20 min
Lesson Plans
Elementary School: K-2
Overview
The students will research facts about squash and put the facts into a guided paper.

Georgia Standards
ELAGSE1W7: Participate in shared research and writing projects (e.g., exploring a number of “how-to” books on a given topic and use them to write a sequence of instructions).

ELAGSE1W8: With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

Objectives:
Students will be able to research using kid-friendly search engines such as www.kidrex.com.

Students will be able to write information gathered from guidance with the teacher/para in the guided writing project.

Materials:
My Squash Report
Lesson Plan

Engage:
• Read books about squash, plant squash, use squash in cooking to get students interested in learning more about

Explore:
• Students will complete the pages What I know about Squash and What I would like to know about Squash in their research project.

Explain:
• Using books about squash or a kid friendly search engine, the student will complete the Compare and Contrast page, Winter and Summer Squash page, and 4 Interesting Facts about Squash. The teacher/para will guide the student in the research and writing.

Extend:
• If the student is able, use a computer writing program with predictive text to allow the student to write the paper on their own.

Evaluate:
• Did the student participate in the research process and gather information?
• Did the student write information or was the student able to tell the adult the information to be written?
My Squash Report

By ____________________________

What Do I Know About Squash?

Zora had plenty of squash in her garden. Think about what you already know about squash. Finish each sentence below.

Squash are ____________________________________________

__________________________________________________________

Squash can _____________________________________________

__________________________________________________________

Squash have _____________________________________________

__________________________________________________________
What Would I Like to Know About Squash

Before beginning research, think about 4 questions you would like to have answered about squash. Write you questions below.

1. ____________________________________________________________

2. ____________________________________________________________

3. ____________________________________________________________

4. ____________________________________________________________
Compare and Contrast Squash With ...

Choose a vegetable that is not a squash. Tell how it is alike or different from the squash.

The squash is a fruit vegetable. The ____________________________ is a ____________________________ vegetable.

Circle one: Alike or Different

Squash is an excellent source of Vitamin A and Vitamin C.

______________________________ is an excellent source of Vitamin _____.

Circle one: Alike or Different

The squash can be traced back to the Native Americans.

The ____________________________ can be traced back to ____________________________.

Circle one: Alike or Different
Winter Squash and Summer Squash

Squash are classified as either winter squash or summer squash. Summer squash are harvested when immature and you can eat them raw. Winter squash can be stored for months and you do not eat the rind (outside) of fruit. Look through a seed catalog and find 3 pictures of winter squash and 3 pictures of summer squash. Glue and label the pictures.
Interesting Squash Facts

Write down 4 interesting facts that you have learned about squash!

1. ________________________________________________________________

2. ________________________________________________________________

3. ________________________________________________________________

4. ________________________________________________________________
Writing Using Descriptive Adjectives to Write an Acrostic Poem

Jenna Mobley, Tending Our Common Ground

Overview
In this lesson, students will learn about squash through observation (and an optional taste test). Students will then read a book about adjectives and identify adjectives that could describe squash - these will be used to create an acrostic poem. As an extension, students will learn about adverbs to create phrases to complete their acrostic poem. **TIME NEEDED: 40 MINUTES**

Common Core Standards

**Adjectives:**

**Kindergarten**
CCSS.ELA-LITERACY.L.K.5.B - Demonstrate understanding of frequently occurring verbs and adjectives.

**1st Grade**
CCSS.ELA-LITERACY.L.1.1.F - Use frequently occurring adjectives.

**2nd Grade**
CCSS.ELA-LITERACY.L.2.6 - Use words and phrases acquired through conversations, readings, and being read to, and responding to texts, including using adjectives and adverbs to describe.

Objectives
Students will understand and use frequently occurring adjectives and adverbs to describe.

Materials
- Squash or photos of squash
- “Hairy, Scary, Ordinary” by Brian P. Cleary (or similar book about adjectives)
- Acrostic Outline for Oh My Squash
- Adjectives to Describe Food Word Banks (and Adverbs!)
Writing Using Descriptive Adjectives to Write an Acrostic Poem

Outline
Engage: Observe squash

Explore: Brainstorm words we know to describe squash

Explain: Read about adjectives and fill acrostic poem in with adjectives

Extend: Learn about adverbs and fill acrostic poem in with adverb phrases

Lesson Plan
Engage / Explore (small groups / at the garden or on the carpet) | 10 MINUTES

Observe a squash plant or harvested squash together either in the garden or in the classroom using all of their senses.

• Optional: Raw Taste Test

Explain (whole group / at seats) | 20 MINUTES

• Explain that describing words are called “adjectives” and read the book, “Hairy, Scary, Ordinary” by Brian P. Cleary to review many different adjectives.

• Read aloud from Adjectives to Describe Food Word Banks (and Adverbs!) adjectives that could describe the look, taste, or texture of food. If it describes squash, students can stand up. If it does not, they can stay seated. If it does describe squash, the teacher can write it on the board as an option for the acrostic.

• Explain that students will complete an acrostic poem about squash, choosing words that start with the letters in either the word “Oh My Squash” and that describe squash.

• Provide students with an Acrostic Outline for either “Oh My Squash” and guide them in choosing words from the board that fit into the acrostic.
Writing Using Descriptive Adjectives to Write an Acrostic Poem

Extend (whole group / at seats) | 10 MINUTES

Explain that “adverbs” are words used to describe how, where, when, how often, or why something is - sometimes they can be used right in front of an adjective.

- Read aloud from Adjectives to Describe Food Word Banks (and Adverbs!) adverbs that could go in front of adjectives to describe the look, taste, or texture of food. The teacher can write these options on the board so students can use them to fill in their acrostic poem.
- Challenge students that finish early to extend their acrostic poem to “Summer Squash” or create a new one for “Zucchini.”

Evaluate:

Example Evaluation

<table>
<thead>
<tr>
<th>Engage / Explore</th>
<th>Student participated in observing the squash using all five of their senses.</th>
<th>/ 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain (CSS.ELA-LITERACY.L.K.5.B. CSS.ELA-LITERACY.L.1.1F.)</td>
<td>Student listened as the book was being read and actively participated in identifying and using appropriate adjectives.</td>
<td>/ 40</td>
</tr>
<tr>
<td>Extend (CCSS.ELA-LITERACY.L.2.6.)</td>
<td>Student actively participated in using appropriate adverbs in phrases with adjectives to describe squash.</td>
<td>/ 40</td>
</tr>
</tbody>
</table>

Total / 100
### Writing

**Acrostic Outline for Squash**

<table>
<thead>
<tr>
<th>Adjectives to Describe Taste</th>
<th>Adjectives to Describe Texture</th>
<th>Adverbs to Add in Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Bitter</td>
<td>● Chewy</td>
<td>● Always</td>
</tr>
<tr>
<td>● Burnt</td>
<td>● Creamy</td>
<td>● Exactly</td>
</tr>
<tr>
<td>● Buttery</td>
<td>● Crispy</td>
<td>● Fortunately</td>
</tr>
<tr>
<td>● Delectable</td>
<td>● Crumbly</td>
<td>● Frequently</td>
</tr>
<tr>
<td>● Delicious</td>
<td>● Crunchy</td>
<td>● Generally</td>
</tr>
<tr>
<td>● Flavorful</td>
<td>● Dry</td>
<td>● Hardly</td>
</tr>
<tr>
<td>● Fresh</td>
<td>● Gooey</td>
<td>● Never</td>
</tr>
<tr>
<td>● Fruity</td>
<td>● Greasy</td>
<td>● Normally</td>
</tr>
<tr>
<td>● Hot</td>
<td>● Juicy</td>
<td>● Occasionally</td>
</tr>
<tr>
<td>● Irresistible</td>
<td>● Moist</td>
<td>● Often</td>
</tr>
<tr>
<td>● Mellow</td>
<td></td>
<td>● Only</td>
</tr>
<tr>
<td>● Mild</td>
<td></td>
<td>● Just</td>
</tr>
<tr>
<td>● Peppery</td>
<td></td>
<td>● Perfectly</td>
</tr>
<tr>
<td>● Pickle</td>
<td></td>
<td>● Rarely</td>
</tr>
<tr>
<td>● Plain</td>
<td></td>
<td>● Seldom</td>
</tr>
<tr>
<td>● Refreshing</td>
<td></td>
<td>● Seriously</td>
</tr>
<tr>
<td>● Rich</td>
<td></td>
<td>● So</td>
</tr>
<tr>
<td>● Ripe</td>
<td></td>
<td>● Sometimes</td>
</tr>
<tr>
<td>● Salty</td>
<td></td>
<td>● Unexpectedly</td>
</tr>
<tr>
<td>● Savory</td>
<td></td>
<td>● Usually</td>
</tr>
<tr>
<td>● Sharp</td>
<td></td>
<td>● Very</td>
</tr>
<tr>
<td>● Sour</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Spicy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Strong</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Sweet</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Tangy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Tart</td>
<td></td>
<td></td>
</tr>
<tr>
<td>● Zesty</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adjectives to Describe Look

- Red
- Orange
- Yellow
- Green
- Blue
- Purple
- Black
- Brown
- Tiny
- Small
- Large
- Huge
- Round
- Flat
Writing Narrative and Informational Pieces About Squash

Jenna Mobley, Tending Our Common Ground

Overview
This lesson will challenge students to describe squash in many different ways. Students will brainstorm qualities and uses of squash from the perspective of a chef, historian, doctor, scientist, artist, and animal. Students will be guided in dictating, drawing, and/or writing both a narrative story (using characters, setting, and plot) and an informational piece about squash (identifying a main idea and including details). **TIME NEEDED 35 MINUTES**

Common Core Standards:
Text Types and Purposes

• Kindergarten
  › **CCSS.ELA-LITERACY.W.K.2** Use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic.
  
  › **CCSS.ELA-LITERACY.W.K.3** Use a combination of drawing, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.

• 1st Grade
  › **CCSS.ELA-LITERACY.W.1.2** Write informative/explanatory texts in which they name a topic, supply some facts about the topic, and provide some sense of closure.
  
  › **CCSS.ELA-LITERACY.W.1.3** Write narratives in which they recount two or more appropriately sequenced events, include some details regarding what happened, use temporal words to signal event order, and provide some sense of closure.
Writing Narrative and Informational Pieces About Squash

• 2nd Grade
  › **CCSS.ELA-LITERACY.W.2.2** Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section.
  › **CCSS.ELA-LITERACY.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, use temporal words to signal event order, and provide a sense of closure.

Objectives:
• Students will write an informative text that describes using details and a concluding statement.
• Students will write a narrative that recounts a short sequence of events and provides a sense of closure.

Materials
• Hats or props to represent different types of people (or use these Posters)
• Squash or photos of squash
• Narrative Writing Mind Map Poster
• Informational Writing Mind Map Poster

Outline
Engage: Squash observation with five senses (an optional taste test could be included)
Explore: Explore attributes of squash and its uses from many perspectives
Explain: Review elements of narrative and informational texts
Extend: Draw, dictate, or write narrative and informational texts
Lesson Plan

Engage (whole group / at the garden or on the carpet) | 5 MINUTES
Observe a squash plant or harvested squash together either in the garden or in the classroom. Ask students to describe the squash. Encourage students to think creatively, remind them to use all of their senses.

Explore (small groups / at seats) | 10 MINUTES
• Teacher asks students to think creatively about how the qualities of squash and uses may be viewed in different ways by different people.
• Teacher distributes various props or posters (one to each small group) to represent different types of people and models one thought each person may ask before asking students to develop their own in their small groups.
Writing Narrative and Informational Pieces About Squash

Examples may include:

› Chef:
  • What does this taste like?
  • What would happen if I cooked it?
  • What other foods would it taste good with?

› Historian:
  • How long has this plant been growing on the planet?
  • How long have people been eating it?

› Doctor:
  • What vitamins and minerals does this plant contain?
  • How does this plant help human bodies?

› Scientist:
  • How does this plant grow?
  • What plant family does it belong to?

› Plant:
  • Will this plant help me grow?
  • Will it drink all of my water?
  • Will I grow taller and get to the sunlight first?

› Artist:
  • What color would I use to paint it?
  • What shape are the different parts of the plant?

› Animal:
  • Will this taste good?
  • Is it poisonous? Will it hurt me to eat it?

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Writing Narrative and Informational Pieces About Squash

**Explain / Extend (independent or in small groups / at seats) | 20 MINUTES**

- Introduce that there are many ways to write about squash (or any topic) if we just think creatively.

- Explain narrative writing using a mind map to identify the elements:
  - Setting
  - Characters
  - Plot (beginning, middle, end)

- Students create their own narratives about squash (in small groups or independently) by drawing, dictating, or writing.

- Explain informational writing using a mind map to identify the elements:
  - Main Idea
  - Details

- Students create their own informational texts about squash (in small groups or independently) by drawing, dictating, or writing.
Writing Narrative and Informational Pieces About Squash

Evaluate

Example Evaluation

<table>
<thead>
<tr>
<th>Primer Level</th>
<th>Informative Writing</th>
<th>Narrative Writing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CCSS.ELA-LITERACY.W.K.2</strong></td>
<td>The student used a combination of drawing, dictating, and writing to compose and informative text in which they</td>
<td><strong>CCSS.ELA-LITERACY.W.K.3</strong></td>
</tr>
<tr>
<td></td>
<td>• Named a topic</td>
<td>• Narrate a single event or several loosely linked events</td>
</tr>
<tr>
<td></td>
<td>• Supplied some facts about the topic</td>
<td>• Tell about the events in the order in which they occurred</td>
</tr>
<tr>
<td>Level 1</td>
<td><strong>CCSS.ELA-LITERACY.W.1.2</strong></td>
<td>• Provide a reaction to what happened</td>
</tr>
<tr>
<td></td>
<td>The student wrote an informative text in which they</td>
<td><strong>CCSS.ELA-LITERACY.W.1.3</strong></td>
</tr>
<tr>
<td></td>
<td>• Named a topic</td>
<td>The student wrote a narrative in which they</td>
</tr>
<tr>
<td></td>
<td>• Supplied some facts about the topic</td>
<td>• Recounted two or more appropriately sequenced events</td>
</tr>
<tr>
<td></td>
<td>• Provided some sense of closure</td>
<td>• Included some details regarding what happened</td>
</tr>
<tr>
<td>Level 2</td>
<td><strong>CCSS.ELA-LITERACY.W.1.2</strong></td>
<td>• Used temporal words to signal event order</td>
</tr>
<tr>
<td></td>
<td>The student wrote an informative text in which they</td>
<td>• Provided some sense of closure</td>
</tr>
<tr>
<td></td>
<td>• Named a topic</td>
<td><strong>CCSS.ELA-LITERACY.W.2.3</strong></td>
</tr>
<tr>
<td></td>
<td>• Supplied some facts about the topic</td>
<td>The student wrote a narrative in which they</td>
</tr>
<tr>
<td></td>
<td>• Provided some sense of closure</td>
<td>• Recounted a well-elaborated event or short sequence of events</td>
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<tr>
<td></td>
<td></td>
<td>• Included details to describe actions, thoughts, and feelings</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Used temporal words to signal event order</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Provided a sense of closure</td>
</tr>
</tbody>
</table>

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Writing Narrative and Informational Pieces about Squash Perspective Posters
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Writing Narrative and Informational Pieces about Squash Perspective Posters
**Writing Narrative and Informational Pieces about Squash Perspective Posters**

- **Chef:**
  - What does this taste like?
  - What would happen if I cooked it?
  - What other foods would it taste good with?

- **Historian:**
  - How long has this plant been growing on the planet?
  - How long have people been eating it?

- **Doctor:**
  - What vitamins and minerals does this plant contain?
  - How does this plant help human bodies?

- **Scientist:**
  - How does this plant grow?
  - What plant family does it belong to?

- **Artist:**
  - What color would I use to paint it?
  - What shape are the different parts of the plant?

- **Animal:**
  - Will this taste good?
  - Is it poisonous? Will it hurt me to eat it?

- **Plant:**
  - Will this plant help me grow?
  - Will it drink all of my water?
  - Will I grow taller and get to the sunlight first?
Narrative Writing Story Map

Setting

Characters

Beginning

Middle

End

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Zucchini Pancakes Lesson Plan

Overview
The teacher will read Zora’s Zucchini by Katherine Pryor. In the book Zora and her family eat zucchini for breakfast, lunch and dinner. Usually Zucchini is eaten mainly for lunch and dinner. Why did Zora’s family use zucchini for breakfast? Use the visuals to make Zucchini Pancakes for breakfast.

Georgia Standards
ELAGSE1SL2: Ask and answer questions about key details in a text read aloud or information presented orally or through other media.
ELAGSE2RL3: Describe how characters in a story respond to major events and challenges.
ELAGSE1RI7: Use illustrations and details in a text to describe its key ideas.

Objectives:
• Students will be able to answer questions about the book read aloud to them.
• Students will be able to tell how the family responded to the challenge of having too many zucchini.
• Students will be able to use the visuals and the steps in the recipe to make Zucchini Pancakes.

Materials:
• From the grocery store: zucchini, eggs, green onions, plain flour, grated parmesan cheese, baking powder, salt, oregano, oil
• From a mobile kitchen cart: grater/shredder, spoons, bowls, conduction pan
• From the classroom: Zora’s Zucchini, visuals
Lesson Plan

Engage:

• Teacher will read Zora’s Zucchini to students.
• Teacher shows the students 2 whole zucchini.
• Teacher cuts one in half (as you would to make slices) and lets the students observe the inside.
• Is there another way we can cut the other zucchini. After discussion the teacher will cut the other lengthwise. Compare and contrast the differences with the first zucchini.
• Is there any other way that zucchini can be cut and prepared for a recipe?

Explore:

• Show the students a 4-sided food grater.
• Discuss the different sides and the uses for them.
• Discuss safety when using the grater. For most students you will want to guide them to keep fingers away from sharp edges.

Explain:

• Usually zucchini is eaten for lunch and dinner. Why did Zora’s family use zucchini for breakfast?
• Discuss pancakes and that zucchini can be used in a pancake recipe.
• Show the recipe and visual for making the zucchini pancakes. Make the zucchini pancakes with the students.
Extend:

• Make recipe for lunch or dinner using zucchini.
• What other recipe could zucchini be used in for breakfast?

Evaluate:

• Did the students ask and answer questions about details in the book read aloud or information presented with the recipe?
• Could the students tell what challenge Zora’s family was having that caused them to use zucchini for breakfast?
• Were the students able to use the visual to make the recipe?
Zucchini Pancakes

Steps

1. Grate the zucchini.

2. Blot grated zucchini with paper towels to remove moisture.

3. Stir zucchini, eggs, and onion in a large bowl.

4. Mix flour, Parmesan cheese, baking powder, salt, and oregano in a separate bowl. Stir mixture into zucchini until batter is just moistened.

5. Heat vegetable oil in a large skillet over medium-high heat. Drop rounded spoonfuls of zucchini batter into hot oil; pan fry until golden, 2 to 3 minutes per side. Drain pancakes on a paper towel-lined plate.

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Science: Edible Plant Parts

Jenna Mobley, Tending Our Common Ground

Overview

This lesson extends students’ knowledge about the plant parts to the fruits and vegetables that they eat. Students will be challenged to match an image of a familiar fruit or vegetable to how it grows on the full plant. This will help them discover the function of the plant part that we consume. The lesson is extended by creating a plant parts salad or by playing a plant parts relay game.

TIME NEEDED: 20 MINUTES + OPTIONAL EXTENDED TIME

Georgia Performance Standards

Life Science:

• Kindergarten
  › SKL1c. Students should be able to group plants according to their observable features such as appearance, size, etc.

• 1st Grade
  › S1L1a. Students should be able to identify the parts of a plant: root, stem, leaf, flower.

Objectives:

• Students will be able to match the food we eat to the plant it grows on.
• Students will be able to identify which part of the plant we most commonly eat.
• Students will be able to group plants according to the plant part that we most commonly eat.
Science Edible Plant Parts

Materials:

From Kitchen:
- Large salad bowl
- Tongs
- Bowls and forks (1 for each student)
- Other items dependent on teaching method

From Grocery Store
- Root—Carrots, Radishes, Beets
- Stem—Celery, Asparagus, Broccoli
- Leaf—Baby Kale, Lettuce, Baby Chard, Arugula
- Flower—Broccoli, Cauliflower
- Fruit—Summer Squash, Zucchini, Tomatoes, Oranges, Berries
- Seed—Peas, Corn, Sunflower Seeds

Reproducibles:
- Plant Parts Cards (Set 1, Set 2)
- 1 Plant Parts Cheat Sheet
- 1 set of Plant Part Purpose posters

Outline:
- Engage: Match edible plant parts to the full plants
- Explore: Sort edible plant part / full plant matches by plant part name
- Explain: Brainstorm plant part purpose for plant, Sing “Roots, Stems, and Leaves”
- Extend: Make plant parts salad and/or play plant parts relay

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Lesson Plan

Engage (whole group / moving throughout room) | 5 MINUTES

- Activate students’ prior knowledge by distributing a card from the Fruit and Vegetable deck to each student. Then scatter the cards from the Full Plants deck across the tabletops. When instructed, students are tasked with finding the image of the full plant that matches their edible plant part.

- When students have found their matches, share cards that show the images of the edible plant part and the matching full plant throughout the class to ensure accuracy.

Explore (independently / moving throughout room) | 5 MINUTES

- Challenge students to use what they know about the plant parts (root, stem, leaf, flower, fruit, and seed) to determine how to classify their edible plant part. Specifically recognize that the fruit is a casing for a seed since many students will be familiar with the culinary definition of a fruit but may miss vegetables that fit that botanical definition of a fruit like green beans.

- Allow students to move around the room to find other students whose plants have the same edible plant part. This will allow them to compare and contrast against each other and to self check.

Explain (small group / throughout room) | 10 MINUTES

- When students have organized themselves by edible plant part, allow the small groups to think independently, discuss with their small group, then share with the class what purpose they think that plant part serves for the plant (specify that this is not the purpose it serves for humans which will likely be to eat, but rather how it serves the plant before we harvest it)!
• After the small groups share their answers, the teacher can provide them with their Plant Part Purpose poster so they can sing their verse of the song “Roots, Stems, and Leaves” and see if they were correct!

› Roots:

   ‘The roots hold the plant in the ground,
   They gather up the water that falls around.
   And there’s a root inside of me,
   Because carrot is a root that I eat.’

› Stems:

   ‘A stem is an elevator growing up from the ground.
   The water goes up and the sugar back down.
   And there’s a stem inside of me,
   Because celery is a stem that I eat.’

› Leaves:

   ‘The leaves are the kitchens where the food is done.
   They breathe the air and catch rays from the sun.
   And there’s a leaf inside of me
   Because lettuce is a leaf that I eat.’

› Flowers:

   ‘The flowers are dressed so colorfully,
   They hold the pollen and attract the bees.
   And there’s a flower inside of me
   Because cauliflower is a flower I eat.’

› Fruit:

   ‘The fruit gets ripe, the falls on down
   It holds the seeds and feeds the ground.
   And there’s a fruit inside of me
   Because squash is a fruit I eat.’

› Seeds:

   “The seeds get buried in the earth,
   And the cycle starts again with a new plant’s birth.
   And there are seeds inside of me
   Because sunflower is a seed that I eat.”
Science  Edible Plant Parts

Extend

• Make and Taste a Plant Parts Salad (whole group / in seats) - 25 minutes
  › Ingredients (one of each):
    • **Root**—Carrots, Radishes, Beets
    • **Stem**—Celery, Asparagus, Broccoli
    • **Leaf**—Baby Kale, Lettuce, Baby Chard, Arugula
    • **Flower**—Broccoli, Cauliflower
    • **Fruit**—Summer Squash, Zucchini, Tomatoes, Oranges, Berries
    • **Seed**—Peas, Corn, Sunflower Seeds
  › Resources:
    • *Facilitating a Taste Test (in the Classroom)*

• Plant Parts Relay (whole group / outside) - 25 minutes
  › Place the Plant Part Name cards in a line across the field.
  › Divide the class in half and instruct each team of students to form a line across the field from the Plant Part Name cards.
  › Distribute the Fruit and Vegetable cards - half to one group of students, half to the other group of students and when instructed the first student in the line can run across the field with the first card of the deck to place the card on the Plant Part Name that corresponds to the fruit or vegetable shown on their card.
  › When they return back to their team, they hand over the deck to the second student in line and then move to the end of the line so the game can continue until one team runs out of cards.

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Evaluate

*Example Participation Evaluation*

<table>
<thead>
<tr>
<th>Engage (SKL1c.)</th>
<th>Student participated in matching their individual Fruit or Vegetable card with their Full Plant card.</th>
<th>/ 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explore (S1L1a.)</td>
<td>Student participated in working with classmates to group the plants by the edible plant parts.</td>
<td>/ 25</td>
</tr>
<tr>
<td>Explain</td>
<td>Student actively participated in discussion of the purpose of the plant part and singing “Roots, Stems, and Leaves” to confirm hypothesis.</td>
<td>/ 25</td>
</tr>
<tr>
<td>Extend</td>
<td>Student was actively engaged in the extension activity.</td>
<td>/ 25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>/ 100</td>
</tr>
</tbody>
</table>
Plant Cards Set 1

Oh My Squash!

Elementary School
GA Standards
20 min

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#ohmysquash
Plant Cards Set 1

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Plant Cards Set 1

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Plant Cards Set 1

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Plant Cards Set 1

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Plant Cards Set 1

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Elementary School  GA Standards  20 min
Plant Cards Set 1

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GA Standards

Elementary School  GA Standards  20 min

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Plant Cards Set 2

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GEORGIA ORGANICS  Elementary School  GA Standards  20 min
Plant Cards Set 2

Oh My Squash!

Elementary School  GA Standards  20 min

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Plant Cards Set 2

[Images of vegetables: Brussels sprouts and asparagus]

[Website link: farmtoschool.georgiaorganics.org]

[Hashtags: #ohmysquash]
Plant Cards Set 2
Plant Cards Set 2

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Plant Cards Set 2

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Roots

The roots hold the plant in the ground,
They gather up the water that falls around.

And there’s a root inside of me,
Because a carrot is a root that I eat.
That’s six plant parts, six parts, six plant parts that people need.

The roots hold the plant in the ground,
They gather up the water that falls around.

And there’s a root inside of me,
Because a carrot is a root that I eat.
That’s six plant parts, six parts, six plant parts that people need.

Stem

A stem is an elevator growing up from the ground.

The water goes up and the sugar back down.

And there’s a stem inside of me,
Because celery is a stem that I eat.
Leaves

The leaves are the kitchens where the food is done.
They breathe the air and catch rays from the sun.
And there’s a leaf inside of me,
Because lettuce is a leaf that I eat.

Flower

The flowers are dressed so colorfully,
They hold the pollen and attract the bees.
And there’s a flower inside of me
Because cauliflower is a flower I eat

Fruit

The fruit gets ripe, then falls on down
It holds the seeds and feeds the ground.
And there’s a fruit inside of me
Because an apple is a fruit that I eat

Seed

The seeds get buried in the earth,
And the cycle starts again with a new plant’s birth.
And there are seeds inside of me
Because a garden salad is what I eat
Overview
The class will taste test summer squash or zucchini and then attempt different methods for collecting and analyzing data that shows how many students liked it, loved it, and didn’t care for it - from raising hands, to counting, to using tallies, to creating a human graph, to a pictograph, to a bar graph. After the class discovers the most effective way to collect and organize data, they will survey another class and show their data visually to then analyze effectively.

(TIME NEEDED: APPROXIMATELY 1 HOUR)

Common Core Math Standards:
Measurement and Data

- Kindergarten:
  - CCSS.MATH.CONTENT.K.MD.B.3. Classify objects into given categories; count the number of objects in each category and sort the categories by count.

- 1st Grade:
  - CCSS.MATH.CONTENT.1.MD.C.4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

- 2nd Grade:
  - CCSS.MATH.CONTENT.2.MD.D.10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Objectives:

- Students will be able to classify taste test votes into three given categories and count the number of votes for each category.

- Students will be able to represent data of votes in three categories by drawing a bar graph with a single-unit scale.

- Students will be able to interpret data depicted in a bar graph – asking and answering questions about the total number of votes, how many votes in each category, and how many more / less are in one category than another.
Math Collecting Taste Test Data

Materials:

From the Grocery Store:
- Summer Squash or Zucchini
- Optional: Ingredients for a Squash Recipe or Dressing Recipe
  - Parmesan Yellow Squash Rounds
  - Raw Summer Squash Salad
  - No-Bake Zucchini Bread Granola Bites
  - Zucchini Pizza Bites

From the Classroom:
- Whiteboard and markers
- 20 Index cards with each with a number 1-20
- Graphing chart paper (optional)
- Pencils and coloring supplies

Reproducibles:
- Blank bar graph with 3 categories (1 for each small group)
- Blank tally chart (1 for each small group)

Outline
- Engage: Host a summer squash or zucchini test
- Explore: Explore methods for data collection
- Explain: Explain the method of bar graphs
- Extend: Collect data and create own bar graph

Lesson Plan
Engage (whole group / in seats) | 10 MINUTES
- Taste test summer squash or zucchini with the whole class.
- Resources: Facilitating a Taste Test (in the Classroom)
  - Explore (whole group / on carpet) - 15 minutes

Farm to School Georgia Organics
Elementary School GA Standards 60 min
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Math Collecting Taste Test Data

- Attempt to collect data by raising hands and observing the number of students visually. Ask students:
  - How many students loved it? Liked it? Didn’t care for it?
  - How many more students loved it than didn’t care for it?

  *It should be difficult for students to answer just from a visual and temporary show of hands, particularly with the difficulty of knowing the exact number in each category.*

- Attempt to collect data by counting the number of students and writing the numbers on the board. Ask students:
  - How many students loved it? Liked it? Didn’t care for it?
  - How many more students loved it than didn’t care for it?

  *It should be difficult for students to compute the difference in the number of votes despite an exact number in each category.*

- Create a human version of a bar graph by lining up students that liked it, loved it, and didn’t care for it in parallel lines. Ask students:
  - How many students loved it? Liked it? Didn’t care for it?
  - How many more students loved it than didn’t care for it?

  *While it may be more difficult to tell exactly how many students are in each category, it should be easier to tell how many more / how many less in each category by demonstrating how to find the level between two categories and simply count the students above and below that line.*

- Add number labels to the human bar graph so that all students in each parallel line for each category line up with a specific number. Ask students:
  - How many students loved it? Liked it? Didn’t care for it?
  - How many more students loved it than didn’t care for it?

  *It should be simple for students to find the line of students that correlates with the question and to look across to the axis for the number of students rather than counting. Comparing numbers should be as simple as the previous method.*
Math Collecting Taste Test Data

Explain (whole group / on carpet) | 15 MINUTES

- Explain to students that they are going to work together to create a visual representation of the lines they have created.
- Create a tally chart together representing humans with vertical lines but recalling that the fifth line goes across the group of five for ease of counting.
- Create a pictograph together as a class using figures of humans to represent each student in each of the three categories.
- Create a bar graph together as a class explaining that the figures of humans will now become rectangles in a line with number labels for a clear and simple visual representation to analyze.
- With the class bar graph on display. Ask students:
  - How many students loved it? Liked it? Didn’t care for it?
  - How many more students loved it than didn’t care for it?

  It should be simple for students to determine how many votes were counted in each category and to compare the categories.

Extend (small groups / in seats) | 20 MINUTES

- Allow students to visit other classes to collect data asking the question “Do you like squash?” providing the options “love it,” “like it,” and “don’t care for it” noticing whether the students had participated in a taste test of the vegetable at school yet or whether it’s based on the previous experiences.
- In small groups, students can create a bar graph displaying their data.

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Evaluate

Example Evaluation

*Based on the bar graph you created in your small group...*

**Kindergarten CCSS.MATH.CONTENT.K.MD.B.3.**

- How many students love the vegetable?
- How many students like the vegetable?
- How many students don’t care for the vegetable?

**1st Grade CCSS.MATH.CONTENT.1.MD.C.4.**

- How many students participated in the survey?
- How many more / less students liked the vegetable than didn’t care for the vegetable?

**2nd Grade CCSS.MATH.CONTENT.2.MD.D.10.**

- How many students liked or loved the vegetable?
- How many more / less students liked or loved the vegetable than didn’t care for the vegetable?
# Math Three Category Bar Graph

**Title**

_by_ ____________________________

<table>
<thead>
<tr>
<th>Category 1</th>
<th>Category 2</th>
<th>Category 3</th>
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*(Label)* Don't forget to write in the numbers to show the scale!

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# Math Tally Chart

**Title**

**By**

<table>
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Math Facilitating a Taste Test

Overview

Materials:
- Veggies
- Cutting boards, plates, knives
- Post-it notes
- “Kitchen Parts of Speech” posters
- “Good Enough to Eat” book
- “Before We Eat” book

Focus Standards:
- Science: 5 Senses, Plant Needs, Plant Parts, Seasons
- Math: Division, Graphing
- ELA: Phonics Parts of Speech
- Nutrition

Lesson:

Engage:
- Teacher distributes a paper plate of “mystery veggie” to each table.
- How would you describe what the veggie looks like? What shape is it? What shape would you see if you cut it in half? Review geometry concepts.
- How does the veggie feel, and smell? Use senses.
- What is the name of the veggie? (Teacher collects data).

Explore (in small groups, in garden journal):
- How does the veggie grow? Share big ideas on plant parts.
- When do you think it grows? Share big ideas on seasons.
- How much space do you think it needs to grow? Share big ideas on plant needs.
- How long do you think it takes to grow?

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Math: Facilitating a Taste Test

**Explain:**
- Have you tried this veggie before? (Teacher collects data).
- Why would we eat this veggie? Share big ideas on nutrition.
- How can we divide these veggies among the students? Review division concepts.
- How do we safely cut veggies? Claw and saw. Flat side down.
- After you try the veggie, how should you express your opinion of it? *Model positive adjectives.*
- Let’s eat together!
- What words can use to describe the veggie? Use a word bank of taste and texture adjectives.

**Extend (optional):**
- With Butter and Bread
- With a Dressing

**Evaluate:**
- Bar Graph: Loved it / Liked it / Didn’t Care for it
Lesson Plans
Elementary School: 3-5
Overview
The teacher will read Zora’s Zucchini by Katherine Pryor. The illustrations in the book show that Zora bought 12 zucchini plants. The students will draw arrays of how Zora could plant her zucchini.

Georgia Standards
• MGSE3.OA.1 Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5 × 7. MGSE3.OA.3 Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
• MGSE3.OA.5. Apply properties of operations as strategies to multiply and divide.6 Examples: If 6 × 4 = 24 is known, then 4 × 6 = 24 is also known. (Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2 = 10, then 3 × 10 = 30. (Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5 + 2) = (8 × 5) + (8 × 2) = 40 + 16 = 56. (Distributive property.) Use arrays, area models, and manipulatives to develop understanding of properties.

Objectives:
• Students will be able to use strategies to determine arrays with the product of 12.
• Students will be able to use arrays and repeated addition to solve multiplication problems.

Materials:
Zora’s Zucchini by Katherine Pryor

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Lesson Plan

Engage:
• Teacher will read Zora’s Zucchini to students.
• The teacher will tell the students that the text does not tell many zucchini plants Zora planted, but can we determine from the illustrations?

Explore:
• Farmers grow their crops in arrays to make it easier to look after and harvest.
• Zora has 12 zucchini plants. How could Zora arrange her plants into equal rows and columns?
• Give groups of students a variety of things to make a arrays (counters, real potted zucchini plants, etc.)
• Students will explore different ways to make arrays with the product of 12. Is there only one way to arrange Zora’s plants?

Explain:
• It’s important for the students to understand what a row is so they can make sense of the problem.
• Allow some time for each group to see if they can come up with different ways to solve the Zora’s problem and record their method.
• Explain that if one group has 6 rows of 2 plants and another group has 2 rows of 6 plants, then the answer is the same (commutative property of multiplication).

Extend:
• Zora’s 12 plants have 3 blooms on each. How blooms are on all 12 plants?
• What would be the arrays if Zora brought home 36 plants?
Math Zucchini Arrays

Evaluate:

• What are some strategies you used to solve the problem?
• How can the same problem be represented by two different arrays?
• How does an array model show repeated addition?
Overview

The class will taste test summer squash or zucchini and then attempt different methods for collecting and analyzing data that shows how many students liked it, loved it, and didn’t care for it - from raising hands, to counting, to using tallies, to creating a human graph, to a pictograph, to a bar graph. After the class discovers the most effective way to collect and organize data, they will survey another class and show their data visually to then analyze effectively.

(TIME NEEDED: APPROXIMATELY 1 HOUR)

Common Core Math Standards:
Measurement and Data

• Kindergarten:
  › CCSS.MATH.CONTENT.K.MD.B.3. Classify objects into given categories; count the number of objects in each category and sort the categories by count.

• 1st Grade:
  › CCSS.MATH.CONTENT.1.MD.C.4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

• 2nd Grade:
  › CCSS.MATH.CONTENT.2.MD.D.10. Draw a picture graph and a bar graph (with single-unit scale) to represent a data set with up to four categories. Solve simple put-together, take-apart, and compare problems using information presented in a bar graph.

Objectives:

• Students will be able to classify taste test votes into three given categories and count the number of votes for each category.

• Students will be able to represent data of votes in three categories by drawing a bar graph with a single-unit scale.

• Students will be able to interpret data depicted in a bar graph – asking and answering questions about the total number of votes, how many votes in each category, and how many more / less are in one category than another.
**Math Collecting Taste Test Data**

**Materials:**

**From the Grocery Store:**
- Summer Squash or Zucchini
- Optional: Ingredients for a Squash Recipe or Dressing Recipe
  ‣ Parmesan Yellow Squash Rounds
  ‣ Raw Summer Squash Salad
  ‣ No-Bake Zucchini Bread Granola Bites
  ‣ Zucchini Pizza Bites

**From the Classroom:**
- Whiteboard and markers
- 20 Index cards with each with a number 1-20
- Graphing chart paper (optional)
- Pencils and coloring supplies

**Reproducibles:**
- Blank bar graph with 3 categories (1 for each small group)
- Blank tally chart (1 for each small group)

**Outline**
- Engage: Host a summer squash or zucchini test
- Explore: Explore methods for data collection
- Explain: Explain the method of bar graphs
- Extend: Collect data and create own bar graph

**Lesson Plan**

**Engage (whole group / in seats) | 10 MINUTES**
- Taste test summer squash or zucchini with the whole class.
- Resources: Facilitating a Taste Test (in the Classroom)
  ‣ Explore (whole group / on carpet) - 15 minutes

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Math Collecting Taste Test Data

• Attempt to collect data by raising hands and observing the number of students visually. Ask students:
  › How many students loved it? Liked it? Didn’t care for it?
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  *It should be difficult for students to answer just from a visual and temporary show of hands, particularly with the difficulty of knowing the exact number in each category.*

• Attempt to collect data by counting the number of students and writing the numbers on the board. Ask students:
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Math Collecting Taste Test Data

Explain (whole group / on carpet) | 15 MINUTES

• Explain to students that they are going to work together to create a visual representation of the lines they have created.

• Create a tally chart together representing humans with vertical lines but recalling that the fifth line goes across the group of five for ease of counting.

• Create a pictograph together as a class using figures of humans to represent each student in each of the three categories.

• Create a bar graph together as a class explaining that the figures of humans will now become rectangles in a line with number labels for a clear and simple visual representation to analyze.

• With the class bar graph on display. Ask students:
  › How many students loved it? Liked it? Didn’t care for it?
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  *It should be simple for students to determine how many votes were counted in each category and to compare the categories.*

Extend (small groups / in seats) | 20 MINUTES

• Allow students to visit other classes to collect data asking the question “Do you like squash?” providing the options “love it,” “like it,” and “don’t care for it” noticing whether the students had participated in a taste test of the vegetable at school yet or whether it’s based on the previous experiences.

• In small groups, students can create a bar graph displaying their data.

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Evaluate

*Example Evaluation*

Based on the bar graph you created in your small group...

**Kindergarten CCSS.MATH.CONTENT.K.MD.B.3.**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
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<td>How many students love the vegetable?</td>
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<td>How many students don’t care for the vegetable?</td>
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**1st Grade CCSS.MATH.CONTENT.1.MD.C.4.**

<table>
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<tr>
<td>How many students participated in the survey?</td>
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<td>How many more / less students liked the vegetable than didn’t care for the vegetable?</td>
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**2nd Grade CCSS.MATH.CONTENT.2.MD.D.10.**

<table>
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# Math

## Three Category Bar Graph

**Title**

**By**

*Don’t forget to write in the numbers to show the scale!*

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**GEORGIA ORGANICS**

Elementary School  GA Standards  20 min  

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# Math Tally Chart

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Facilitating a Taste Test

Overview

Materials:
- Veggies
- Cutting boards, plates, knives
- Post-it notes
- “Kitchen Parts of Speech” posters
- “Good Enough to Eat” book
- “Before We Eat” book

Focus Standards:
- **Science:** 5 Senses, Plant Needs, Plant Parts, Seasons
- **ELA:** Phonics Parts of Speech
- **Math:** Division, Graphing
- **Nutrition**

Lesson

Engage:
- Teacher distributes a paper plate of “mystery veggie” to each table.
- How would you describe what the veggie looks like? What shape is it? What shape would you see if you cut it in half? Review geometry concepts.
- How does the veggie feel, and smell? Use senses.
- What is the name of the veggie? (Teacher collects data).

Explore (in small groups, in garden journal):
- How does the veggie grow? Share big ideas on plant parts.
- When do you think it grows? Share big ideas on seasons.
- How much space do you think it needs to grow? Share big ideas on plant needs.
- How long do you think it takes to grow?

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**Math Facilitating a Taste Test**

**Explain:**
- Have you tried this veggie before? (Teacher collects data).
- Why would we eat this veggie? Share big ideas on nutrition.
- How can we divide these veggies among the students? Review division concepts.
- How do we safely cut veggies? Claw and saw. Flat side down.
- After you try the veggie, how should you express your opinion of it? *Model positive adjectives.*
  - Let’s eat together!
  - What words can use to describe the veggie? Use a word bank of taste and texture adjectives.

**Extend (optional):**
- With Butter and Bread
- With a Dressing

**Evaluate:**
- Bar Graph: Loved it / Liked it / Didn’t Care for it
Lesson Plan

Engage (whole group / moving throughout room) | 5 MINUTES

• Activate students’ prior knowledge by distributing a card from the Fruit and Vegetable deck to each student. Then scatter the cards from the Full Plants deck across the tabletops. When instructed, students are tasked with finding the image of the full plant that matches their edible plant part.

• When students have found their matches, share cards that show the images of the edible plant part and the matching full plant throughout the class to ensure accuracy.

Explore (independently / moving throughout room) | 5 MINUTES

• Challenge students to use what they know about the plant parts (root, stem, leaf, flower, fruit, and seed) to determine how to classify their edible plant part. Specifically recognize that the fruit is a casing for a seed since many students will be familiar with the culinary definition of a fruit but may miss vegetables that fit that botanical definition of a fruit like green beans.

• Allow students to move around the room to find other students whose plants have the same edible plant part. This will allow them to compare and contrast against each other and to self check.

Explain (small group / throughout room) | 10 MINUTES

• When students have organized themselves by edible plant part, allow the small groups to think independently, discuss with their small group, then share with the class what purpose they think that plant part serves for the plant (specify that this is not the purpose it serves for humans which will likely be to eat, but rather how it serves the plant before we harvest it)!

• After the small groups share their answers, the teacher can provide them with their Plant Part Purpose poster so they can sing their verse of the song “Roots, Stems, and Leaves” and

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see if they were correct!

› Roots:

“The roots hold the plant in the ground,
They gather up the water that falls around.
And there’s a root inside of me,
Because carrot is a root that I eat.”

› Stems:

“A stem is an elevator growing up from the ground.
The water goes up and the sugar back down.
And there’s a stem inside of me,
Because celery is a stem that I eat.”

› Leaves:

“The leaves are the kitchens where the food is done.
They breathe the air and catch rays from the sun.
And there’s a leaf inside of me
Because lettuce is a leaf that I eat.”

› Flowers:

“The flowers are dressed so colorfully,
They hold the pollen and attract the bees.
And there’s a flower inside of me
Because cauliflower is a flower I eat.”

› Fruit:

“The fruit gets ripe, the falls on down.
It holds the seeds and feeds the ground.
And there’s a fruit inside of me
Because squash is a fruit I eat.”

› Seeds:

“The seeds get buried in the earth,
And the cycle starts again with a new plant’s birth.
And there are seeds inside of me
Because sunflower is a seed that I eat.”

**Extend**

- Make and Taste a Plant Parts Salad (whole
**Science Edible Plant Parts**

- **group / in seats** - 25 minutes
  - **Ingredients (one of each):**
    - **Root**—Carrots, Radishes, Beets
    - **Stem**—Celery, Asparagus, Broccoli
    - **Leaf**—Baby Kale, Lettuce, Baby Chard, Arugula
    - **Flower**—Broccoli, Cauliflower
  - **Fruit**—Summer Squash, Zucchini, Tomatoes, Oranges, Berries
  - **Seed**—Peas, Corn, Sunflower Seeds
  - **Resources:**
    - Facilitating a Taste Test (in the Classroom)
    - Plant Parts Relay (whole group / outside) - 25 minutes
      - Place the Plant Part Name cards in a line across the field.
      - Divide the class in half and instruct each team of students to form a line across the field from the Plant Part Name cards.
      - Distribute the Fruit and Vegetable cards - half to one group of students, half to the other group of students and when instructed the first student in the line can run across the field with the first card of the deck to place the card on the Plant Part Name that corresponds to the fruit or vegetable shown on their card.
      - When they return back to their team, they hand over the deck to the second student in line and then move to the end of the line so the game can continue until one team runs out of cards.

**Evaluate**

*Example Participation Evaluation*

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# Science: Edible Plant Parts

<table>
<thead>
<tr>
<th>Engagement</th>
<th>Description</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engage (SKL1c.)</td>
<td>Student participated in matching their individual Fruit or Vegetable card with their Full Plant card.</td>
<td>/ 25</td>
</tr>
<tr>
<td>Explore (S1L1a.)</td>
<td>Student participated in working with classmates to group the plants by the edible plant parts.</td>
<td>/ 25</td>
</tr>
<tr>
<td>Explain</td>
<td>Student actively participated in discussion of the purpose of the plant part and singing “Roots, Stems, and Leaves” to confirm hypothesis.</td>
<td>/ 25</td>
</tr>
<tr>
<td>Extend</td>
<td>Student was actively engaged in the extension activity.</td>
<td>/ 25</td>
</tr>
</tbody>
</table>

**Total** / 100
Plant Cards Set 1

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Elementary School  GA Standards  20 min

#ohmysquash
Plant Cards Set 1

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Oh My Squash!
Plant Cards Set 1

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GEORGIA ORGANICS

Elementary School   GA Standards   20 min

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Plant Cards Set 1

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Plant Cards Set 1

Elementary School  GA Standards  20 min

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Plant Cards Set 2

GEORGIA ORGANICS

Elementary School  GA Standards  20 min

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Plant Cards Set 2

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GEORGIA ORGANICS

Elementary School  GA Standards  20 min

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Plant Cards Set 2

Elementary School  GA Standards  20 min

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Plant Cards Set 2

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Elementary School  GA Standards  20 min

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Plant Cards Set 2

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**Roots**

The roots hold the plant in the ground,
They gather up the water that falls around.

And there’s a root inside of me,
Because a carrot is a root that I eat.
That’s six plant parts, six parts, six plant parts that people need.

The roots hold the plant in the ground,
They gather up the water that falls around.

And there’s a root inside of me,
Because a carrot is a root that I eat.
That’s six plant parts, six parts, six plant parts that people need.

**Stem**

A stem is an elevator growing up from the ground.

The water goes up and the sugar back down.

And there’s a stem inside of me,
Because celery is a stem that I eat.
Leaves

The leaves are the kitchens where the food is done.
They breathe the air and catch rays from the sun.
And there's a leaf inside of me,
Because lettuce is a leaf that I eat.

Flower

The flowers are dressed so colorfully,
They hold the pollen and attract the bees.
And there's a flower inside of me
Because cauliflower is a flower I eat

Fruit

The fruit gets ripe, then falls on down
It holds the seeds and feeds the ground.
And there's a fruit inside of me
Because an apple is a fruit that I eat

Seed

The seeds get buried in the earth,
And the cycle starts again with a new plant's birth.
And there are seeds inside of me
Because a garden salad is what I eat
Writing Narrative and Informational Pieces About Squash

Jenna Mobley, Tending Our Common Ground

Overview
This lesson will challenge students to describe squash in many different ways. Students will brainstorm qualities and uses of squash from the perspective of a chef, historian, doctor, scientist, artist, and animal. Students will be guided in dictating, drawing, and/or writing both a narrative story (using characters, setting, and plot) and an informational piece about squash (identifying a main idea and including details). Time Needed: 35 minutes

Common Core Standards:
Text Types and Purposes

• 3rd grade

› CCSS.ELA-LITERACY.W.3.1. Write opinion pieces on topics or texts, supporting a point of view with reasons.
  • CCSS.ELA-LITERACY.W.3.1.A. Introduce the topic or text they are writing about, state an opinion, and create an organizational structure that lists reasons.
  • CCSS.ELA-LITERACY.W.3.1.B. Provide reasons that support the opinion.
  • CCSS.ELA-LITERACY.W.3.1.C. Use linking words and phrases (e.g., because, therefore, since, for example) to connect opinion and reasons.
  • CCSS.ELA-LITERACY.W.3.1.D. Provide a concluding statement or section.

› CCSS.ELA-LITERACY.W.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
  • CCSS.ELA-LITERACY.W.3.2.A. Introduce a topic and group related information together; include illustrations when useful to aiding comprehension.
  • CCSS.ELA-LITERACY.W.3.2.B. Develop the topic with facts, definitions, and details.
  • CCSS.ELA-LITERACY.W.3.2.C. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information.
  • CCSS.ELA-LITERACY.W.3.2.D. Provide a concluding statement or section.
Writing Narrative and Informational Pieces About Squash

› CCSS.ELA-LITERACY.W.3.3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

    - CCSS.ELA-LITERACY.W.3.3.A. Establish a situation and introduce a narrator and/or characters; organize an event sequence that unfolds naturally.
    - CCSS.ELA-LITERACY.W.3.3.B. Use dialogue and descriptions of actions, thoughts, and feelings to develop experiences and events or show the response of characters to situations.
    - CCSS.ELA-LITERACY.W.3.3.C. Use temporal words and phrases to signal event order.

• 4th Grade

› CCSS.ELA-LITERACY.W.4.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.

    - CCSS.ELA-LITERACY.W.4.1.A. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which related ideas are grouped to support the writer’s purpose.
    - CCSS.ELA-LITERACY.W.4.1.B. Provide reasons that are supported by facts and details.
    - CCSS.ELA-LITERACY.W.4.1.C. Link opinion and reasons using words and phrases (e.g., for instance, in order to, in addition).
    - CCSS.ELA-LITERACY.W.4.1.D. Provide a concluding statement or section related to the opinion presented.

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Writing Narrative and Informational Pieces About Squash

› CCSS.ELA-LITERACY.W.4.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
   
   • CCSS.ELA-LITERACY.W.4.2.A. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
   
   • CCSS.ELA-LITERACY.W.4.2.B. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.
   
   • CCSS.ELA-LITERACY.W.4.2.C. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because).
   
   • CCSS.ELA-LITERACY.W.4.2.D. Use precise language and domain-specific vocabulary to inform about or explain the topic.
   
   • CCSS.ELA-LITERACY.W.4.2.E. Provide a concluding statement or section related to the information or explanation presented.

› CCSS.ELA-LITERACY.W.4.3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.
   
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   • CCSS.ELA-LITERACY.W.4.3.B. Use dialogue and description to develop experiences and events or show the responses of characters to situations.
   
   • CCSS.ELA-LITERACY.W.4.3.C. Use a variety of transitional words and phrases to manage the sequence of events.
   
   • CCSS.ELA-LITERACY.W.4.3.D. Use concrete words and phrases and sensory details to convey experiences and events precisely.
   
   • CCSS.ELA-LITERACY.W.4.3.E. Provide a conclusion that follows from the narrated experiences or events.
Writing Narrative and Informational Pieces About Squash

• 5th Grade

› CCSS.ELA-LITERACY.W.5.1. Write opinion pieces on topics or texts, supporting a point of view with reasons and information.
   
   • CCSS.ELA-LITERACY.W.5.1.A. Introduce a topic or text clearly, state an opinion, and create an organizational structure in which ideas are logically grouped to support the writer’s purpose.
   
   • CCSS.ELA-LITERACY.W.5.1.B. Provide logically ordered reasons that are supported by facts and details.
   
   • CCSS.ELA-LITERACY.W.5.1.C. Link opinion and reasons using words, phrases, and clauses (e.g., consequently, specifically).
   
   • CCSS.ELA-LITERACY.W.5.1.D. Provide a concluding statement or section related to the opinion presented.

› CCSS.ELA-LITERACY.W.5.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

   • CCSS.ELA-LITERACY.W.5.2.A. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

   • CCSS.ELA-LITERACY.W.5.2.B. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic.

   • CCSS.ELA-LITERACY.W.5.2.C. Link ideas within and across categories of information using words, phrases, and clauses (e.g., in contrast, especially).

   • CCSS.ELA-LITERACY.W.5.2.D. Use precise language and domain-specific vocabulary to inform about or explain the topic.

   • CCSS.ELA-LITERACY.W.5.2.E. Provide a concluding statement or section related to the information or explanation presented.
Writing Narrative and Informational Pieces About Squash

› CCSS.ELA-LITERACY.W.5.3. Write narratives to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

   • CCSS.ELA-LITERACY.W.5.3.A. Orient the reader by establishing a situation and introducing a narrator and/or characters; organize an event sequence that unfolds naturally.

   • CCSS.ELA-LITERACY.W.5.3.B. Use narrative techniques, such as dialogue, description, and pacing, to develop experiences and events or show the responses of characters to situations.

   • CCSS.ELA-LITERACY.W.5.3.C. Use a variety of transitional words, phrases, and clauses to manage the sequence of events.

   • CCSS.ELA-LITERACY.W.5.3.D. Use concrete words and phrases and sensory details to convey experiences and events precisely.

   • CCSS.ELA-LITERACY.W.5.3.E. Provide a conclusion that follows from the narrated experiences or events.

Objectives:

• Students will write an opinion piece supporting a point of view with reasons and information.

• Students will write an informative piece to examine a topic and convey ideas and information clearly.

• Students will write a narrative piece to develop real or imagined experiences or events using effective technique, descriptive details, and clear event sequences.

Materials

• Hats or props to represent different types of people (or use these Perspective Posters)

• Squash plants, harvested squash, or photos of squash plants

• Narrative Writing Mind Map Poster

• Informational Writing Mind Map Poster

• Index Cards

• Pencils

• Optional: squash or zucchini for taste test
Writing Narrative and Informational Pieces About Squash

Outline
Engage: Squash observation with five senses (an optional taste test could be included)
Explore: Seeing squash attributes and uses from many perspectives
Explain: Reviewing elements of narrative, informational, and persuasive texts
Extend: Writing narrative, informational, and persuasive texts about squash

Lesson Plan

Engage (whole group / at the garden or on the carpet) | 5 MINUTES
Observe a squash plant or harvested squash together either in the garden or in the classroom. Ask students to describe the squash. Encourage students to think creatively, remind them to use all of their senses.

Explore (small groups / at seats) | 10 MINUTES
- Teacher asks students to think creatively about how the qualities of squash and uses may be viewed in different ways by different people.
- Teacher distributes various props or posters (one to each small group) to represent different types of people and models one thought each person may ask before asking students to develop their own in their small groups.
Writing Narrative and Informational Pieces About Squash

- Examples may include:
  - **Chef:**
    - What does this taste like?
    - What would happen if I cooked it?
    - What other foods would it taste good with?
  - **Historian:**
    - How long has this plant been growing on the planet?
    - How long have people been eating it?
  - **Doctor:**
    - What vitamins and minerals does this plant contain?
    - How does this plant help human bodies?
  - **Scientist:**
    - How does this plant grow?
    - What plant family does it belong to?
  - **Artist:**
    - What color would I use to paint it?
    - What shape are the different parts of the plant?
  - **Animal:**
    - Will this taste good?
    - Is it poisonous? Will it hurt me to eat it?
  - **Plant:**
    - Will this plant help me grow?
    - Will it drink all of my water?
    - Will I grow taller and get to the sunlight first?

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Writing Narrative and Informational Pieces About Squash

**Explain (independent or in small groups / at seats) | 10 MINUTES**

- Introduce that there are many ways to write about squash (or any topic) if we just think creatively.

- **Narrative**
  - Explain narrative writing using a mind map to identify the elements:
    - Setting
    - Characters
    - Plot (*beginning, middle, end*)
  - The teacher can model or the students in their small groups can dictate a short narrative story to each other to practice.

- **Informational**
  - Explain informational writing using a mind map to identify the elements:
    - Main Idea  
    - Details
  - The teacher can model or the students in their small groups can dictate short informational pieces to each other to practice.

- **Persuasive**
  - Explain persuasive writing using a mind map to identify the elements:
    - Point of View  
    - Reasons
  - The teacher can model or the students in their small groups can dictate short informational pieces to each other to practice.

**Extend (independent or in small groups / at seats) | 15 MINUTES**

- The teacher can assign each student to a different type of writing to be completed as a “quick write” on an index card.

- When students have finished, selected students can read their pieces out loud for other students to guess what type of writing it was. These cards can also be edited, revised, and published to later be laminated and put into a center in which students can sort their class’s writing pieces by the type of writing or use whiteboard markers to highlight the different elements of each writing piece.
## Writing Narrative and Informational Pieces About Squash

### Evaluate

**Example Evaluation**

<table>
<thead>
<tr>
<th>Level 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Persuasive Writing</strong></td>
</tr>
<tr>
<td>CCSS.ELA-LITERACY.W.3.1. Write opinion pieces on topics or texts, supporting a point of view with reasons.</td>
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<tr>
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<tr>
<td>CCSS.ELA-LITERACY.W.3.1.B. Provide reasons that support the opinion.</td>
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<td>CCSS.ELA-LITERACY.W.3.1.C. Use linking words and phrases (e.g., because, therefore, since, for example) to connect opinion and reasons.</td>
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<td>CCSS.ELA-LITERACY.W.3.1.D. Provide a concluding statement or section.</td>
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<td><strong>Informative Writing</strong></td>
</tr>
<tr>
<td>CCSS.ELA-LITERACY.W.3.2. Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</td>
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## Writing Narrative and Informational Pieces About Squash

### Evaluate

**Example Evaluation**

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<tr>
<th>Persuasive Writing</th>
<th>Informative Writing</th>
<th>Narrative Writing</th>
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<tbody>
<tr>
<td><strong>CCSS.ELA-LITERACY.W.4.1.</strong> Write opinion pieces on topics or texts, supporting a point of view with reasons and information.</td>
<td><strong>CCSS.ELA-LITERACY.W.4.2.</strong> Write informative/explanatory texts to examine a topic and convey ideas and information clearly.</td>
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<td><strong>CCSS.ELA-LITERACY.W.4.1.B.</strong> Provide reasons that are supported by facts and details.</td>
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<td><strong>CCSS.ELA-LITERACY.W.4.2.D.</strong> Use precise language and domain-specific vocabulary to inform about or explain the topic.</td>
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**Elementary School**

**GA Standards**

20 min

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**Writing** Narrative and Informational Pieces About Squash

### Evaluate

**Example Evaluation**

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Writing Narrative and Informational Pieces about Squash Perspective Posters

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GEORGIA ORGANICS

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Writing Narrative and Informational Pieces about Squash Perspective Posters

- **Chef:**
  - What does this taste like?
  - What would happen if I cooked it?
  - What other foods would it taste good with?

- **Historian:**
  - How long has this plant been growing on the planet?
  - How long have people been eating it?

- **Doctor:**
  - What vitamins and minerals does this plant contain?
  - How does this plant help human bodies?

- **Scientist:**
  - How does this plant grow?
  - What plant family does it belong to?

- **Artist:**
  - What color would I use to paint it?
  - What shape are the different parts of the plant?

- **Animal:**
  - Will this taste good?
  - Is it poisonous? Will it hurt me to eat it?

- **Plant:**
  - Will this plant help me grow?
  - Will it drink all of my water?
  - Will I grow taller and get to the sunlight first?
Narrative Writing Story Map

Setting

Characters

Beginning

Middle

End

GEORGIA ORGANICS

Elementary School
GA Standards

20 min

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#ohmysquash
Overview
In this lesson, students will learn about squash through observation and an optional taste test. Students will read haiku poems about various vegetables to identify the pattern and elements that the poems have in common (syllable structure). Students will learn about the structure of haiku poems (5 syllables, 7 syllables, 5 syllables) and will write their own haiku poem about squash. If students need further inspiration, they can utilize a word bank for adjectives (and adverbs!) to describe squash and other foods. Time Needed: 40 minutes

Common Core Standards:
English Language Arts:
• 3rd Grade
  › CCSS.ELA-LITERACY.L.3.2.F. Use spelling patterns and generalizations (e.g., word families, position-based spellings, syllable patterns, ending rules, meaningful word parts) in writing words.

Objectives:
• Students will understand and use syllable patterns to write a haiku.

Materials:
• Squash or photos of squash
• Vegetable Haiku Examples
• Haiku Outline
• Adjectives to Describe Food Word Banks (and Adverbs!)

Outline:
• Engage: Observe squash
• Explore: Read vegetables haikus and describe the patterns
• Explain: Learn about syllable patterns in haiku poems
• Extend: Write a haiku about squash
Lesson Plan

Engage (small groups / at the garden or at tables) | 10 MINUTES
• Observe a squash plant or harvested squash together either in the garden or in the classroom using all of their senses.
• Optional: Taste test of squash

Explore (small rotating groups / across the garden or classroom) | 10 MINUTES
• Place the eight vegetable haiku examples across the space. Divide students into eight small groups and allow them to rotate through, reading each of the poems and looking for the pattern between them.

Explain (whole group / at seats) | 10 MINUTES
• Explain that haikus are three-lined poems that follow a syllable pattern - five syllables, seven syllables, five syllables.
• Explain that students will complete a haiku poem about squash by choosing phrases that match the syllable pattern and describe squash.
• Provide students with the Haiku Outline and allow them time to brainstorm words and phrases that would fit.

Extend (whole group / at seats) | 10 MINUTES
• Read aloud from Adjectives to Describe Food Word Banks (and Adverbs!) adjectives that could describe the look, taste, or texture of food. If it describes squash, students can stand up. If it does not, they can stay seated. If it does describe squash, the teacher can write it on the board as an option for the acrostic.
• Explain that “adverbs” are words used to describe how, where, when, how often, or why something is - sometimes they can be used right in front of an adjective. Read aloud from Adjectives to Describe Food Word Banks (and Adverbs!) to find adverbs that could go in front of adjectives to describe the look, taste, or texture of food. The teacher can write these options on the board so students can use them to complete phrases in their haiku.

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**Writing** Using Knowledge of Syllables to Write a Haiku Poem

**Evaluate**

*Example Evaluation*

<table>
<thead>
<tr>
<th>Engage / Explore</th>
<th>Student participated in observing the squash using all five of their senses.</th>
<th>/ 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain (CCSS.ELA-LITERACY.L.3.2.F.)</td>
<td>Student actively participated in using syllables to write a haiku to describe squash.</td>
<td>/ 40</td>
</tr>
<tr>
<td>Extend (CCSS.ELA-LITERACY.L.2.6.)</td>
<td>Student actively participated in using appropriate adverbs in phrases with adjectives to describe squash.</td>
<td>/ 40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>/ 100</td>
</tr>
</tbody>
</table>

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Writing Vegetable Haiku Examples

Broccoli, so green
Sautéed, roasted, steamed or raw
Any way, tasty

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Writing Vegetable Haiku

Examples

HEIRLOOM TOMATO
MY FAVORITE SEASON IS YOURS
SALT, SUGAR, MAGIC
Writing Vegetable Haiku Examples

FIBER, VITAMINS COMPLETER OF BBQS NOTHING LIKE A COB
Writing Vegetable Haiku Examples

WITHOUT RANCH DRESSING TOO FEW APPRECIATE YOU YOU DEAR, SWEET CARROT
Writing Vegetable Haiku Examples

COOK THEM IN A PAN, SAUTE UNTIL THEY ARE BROWN, HASHTAG PARSNIP LOVE

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Writing Vegetable Haiku Examples

GOOD MORNING TO YOU, MY CRUCIFEROUS DELIGHTS. TONIGHT YOU ARE MINE.

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Writing Vegetable Haiku Examples

DEEP VIOLET COVER
ANTIOXIDANT BRIMMING
TEXTURE SO UNIQUE

farmtoschool.georgiaorganics.org  #ohmysquash
Writing Vegetable Haiku Examples

IT IS YOUR GREEN STRING THAT MAKES YOU YOU, CELERY. PLEASE DON'T CHANGE A THING
Oh My Squash

By ________________________________

__________________________________ (5 syllables)

__________________________________ (7 syllables)

__________________________________ (5 syllables)

farmtoschool.georgiaorganics.org  #ohmysquash
<table>
<thead>
<tr>
<th>Adjectives to Describe Taste</th>
<th>Adjectives to Describe Texture</th>
<th>Adverbs to Add in Front</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bitter</td>
<td>Chewy</td>
<td>Always</td>
</tr>
<tr>
<td>Burnt</td>
<td>Creamy</td>
<td>Exactly</td>
</tr>
<tr>
<td>Buttery</td>
<td>Crispy</td>
<td>Fortunately</td>
</tr>
<tr>
<td>Delectable</td>
<td>Crumbly</td>
<td>Frequently</td>
</tr>
<tr>
<td>Delicious</td>
<td>Crunchy</td>
<td>Generally</td>
</tr>
<tr>
<td>Flavorful</td>
<td>Dry</td>
<td>Hardly</td>
</tr>
<tr>
<td>Fresh</td>
<td>Gooey</td>
<td>Never</td>
</tr>
<tr>
<td>Fruity</td>
<td>Greasy</td>
<td>Normally</td>
</tr>
<tr>
<td>Hot</td>
<td>Juicy</td>
<td>Occasionally</td>
</tr>
<tr>
<td>Irresistible</td>
<td>Moist</td>
<td>Often</td>
</tr>
<tr>
<td>Mellow</td>
<td></td>
<td>Only</td>
</tr>
<tr>
<td>Mild</td>
<td></td>
<td>Just</td>
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<tr>
<td>Peppery</td>
<td></td>
<td>Perfectly</td>
</tr>
<tr>
<td>Pickle</td>
<td></td>
<td>Rarely</td>
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<tr>
<td>Plain</td>
<td></td>
<td>Seldom</td>
</tr>
<tr>
<td>Refreshing</td>
<td></td>
<td>Seriously</td>
</tr>
<tr>
<td>Rich</td>
<td></td>
<td>So</td>
</tr>
<tr>
<td>Ripe</td>
<td></td>
<td>Sometimes</td>
</tr>
<tr>
<td>Salty</td>
<td></td>
<td>Unexpectedly</td>
</tr>
<tr>
<td>Savory</td>
<td></td>
<td>Usually</td>
</tr>
<tr>
<td>Sharp</td>
<td></td>
<td>Very</td>
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<tr>
<td>Sour</td>
<td></td>
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<tr>
<td>Spicy</td>
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<tr>
<td>Strong</td>
<td></td>
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<tr>
<td>Sweet</td>
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<tr>
<td>Tangy</td>
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<td>Tart</td>
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<td>Zesty</td>
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<td></td>
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<tr>
<td>Adjectives to Describe Look</td>
<td></td>
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<tr>
<td>Red</td>
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<tr>
<td>Orange</td>
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<tr>
<td>Yellow</td>
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<tr>
<td>Green</td>
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<tr>
<td>Blue</td>
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<tr>
<td>Purple</td>
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<tr>
<td>Black</td>
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<tr>
<td>Brown</td>
<td></td>
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<tr>
<td>Tiny</td>
<td></td>
<td></td>
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<tr>
<td>Small</td>
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<td></td>
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<tr>
<td>Large</td>
<td></td>
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<tr>
<td>Huge</td>
<td></td>
<td></td>
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<tr>
<td>Round</td>
<td></td>
<td></td>
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<tr>
<td>Flat</td>
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</tr>
</tbody>
</table>

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Elementary School  GA Standards  20 min
Lesson Plans
High School: 9-12
Food Science Squash Blossoms —

Brooke Lewis-Slamkova
Apalachee High School Educator and Maple Park Homestead Farmer

Overview
This lesson will challenge students to use various food preparation methods to create the maillard reaction. (Time Needed: 2 class periods.)

Standards:
FCS-FS-4. Students will discuss how energy works in food preparation and preservation.

a. Explain how heat is transferred in the cooking, baking, and thermal preservation processes and demonstrate the methods of boiling, roasting, and microwaving.
b. Compare the effect of various temperatures on rates of chemical and physical reactions.

Objectives:
• Students will understand how various cooking methods work, ie. convection, conduction.
• Students will evaluate which method they prefer for squash blossoms.
• Students will discuss how this is a beneficial secondary crop for farmers.

Materials:
• Squash blossoms (male) from school garden or farmer’s market.
• Maillard reaction video - https://www.youtube.com/watch?v=NtwwjRYNw9c
• Great article about cooking squash blossoms - https://www.thekitchn.com/five-ways-to-eat-squash-blosso-87564
• Lab sheets (See below.)
• Lab rubric (See below.)
• Recipes:
  › Baked
  › Fried Only the blossoms, not the sauce

Outline
Engage: Students will learn the maillard reaction and its importance in food preparation.
Explore: Students will explore different cooking methods.
Explain: Teacher will explain how conduction and convection work.
Extend: Students can examine the difference in cooking methods and taste.
Lesson Plan

Engage
Students can go out to the school garden to harvest male flowers. If blossoms were purchased, begin by exploring the blossoms and brainstorm what the students think they will taste like. How would they imagine cooking them?

Explore
Have students watch the maillard reaction video. Have them describe the foods they have eaten that are golden brown and delicious (GBD) and why they are so good. Have them explore two recipes and decide where golden brown color comes from.

Explain
Teacher will explain how different cooking methods work, ie. conduction, convection. Teacher will then break students into lab groups and assign groups one cooking method for the squash blossoms.

Extend
Students will complete the lab duty sheets and be checked by teacher for proper attire. Students will prepare mise en place and prepare recipe. Students will document final product with a picture and taste recipe. Baked group will share their samples with the fried group and vice versa.

Evaluate
Students will vote on which recipe they liked better and make suggestions on cooking methods and their effectiveness in creating a golden brown exterior. Teacher will evaluate the lab groups using the rubric attached.
Food Science — Squash Blossoms

Dishwasher: Nutrition Facts Sheet

Recipe ___________________________  Group # ________

**Step 1:** Take a look at the recipe and locate all of the healthy foods (vegetables, fruits, meats, whole grains, etc.)

**Step 2:** List those foods below and list the nutrients and benefits of each food.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Nutrients and Health Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXAMPLE: Green Bell Peppers</td>
<td>Good source of fiber, vitamin C, vitamin E. Reduces risk of heart disease and diabetes. Supports a strong immune system</td>
</tr>
</tbody>
</table>

[Images and logos are not transcribed.]
Executive Chef: Lab Work Schedule

Executive Chef ____________________________________________________________

Recipe _________________________________________________________________ Group # ______

<table>
<thead>
<tr>
<th>Time</th>
<th>Task To Be Completed</th>
<th>Completed By</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preliminary Duties:</td>
<td></td>
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<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
Food Science  Squash Blossoms —

Prep Cook: Planning Sheet

Prep Cook  

Recipe  Group #

Step 1: List all of the ingredients and the amounts of each that you need to collect from the supply table in order to complete this recipe.

<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Amount Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Step 2: Draw the measuring equipment and other items you need on the tray that you will take to the supply table.

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Food Science  Squash Blossoms —

Sous Chef: Lab Sheet

Sous Chef ____________________________________________
Recipe ____________________________________________ Group # ______

Step 1: List all of the equipment that your group will need to prepare this recipe except measuring tools. (The prep cook will assemble the measuring tools.) This includes small equipment, utensils, parchment paper and small electrical appliances. You do not need to include the range or oven.

<table>
<thead>
<tr>
<th>“Mise en Place”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kitchen Equipment and Appliances</strong></td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
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<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
</tbody>
</table>

Step 2: Draw how you will set up the countertop for the executive chef.

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High School  GA Standards  20 min
### Culinary Lab Rubric

**Group Members**

**Recipe**

**Kitchen**

Criteria: The executive chef will complete an evaluation of the lab before returning the lab folder to the teacher.

<table>
<thead>
<tr>
<th>Lab Plans</th>
<th>Safety</th>
<th>Sanitation</th>
<th>Assembly of Ingredients</th>
<th>Kitchen Competence</th>
<th>Cooperation</th>
<th>Finished Product Presentation</th>
<th>Points Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Chef, Sous Chef, Prep Cook, Wait Staff</td>
<td>All safety rules are followed</td>
<td>Personal Hygiene, Proper food-handling techniques, Proper cleaning techniques</td>
<td>Correct measuring tools, Correct measuring techniques, Clean supply table</td>
<td>“Mise en Place,” Correct equipment for task, Correct technique</td>
<td>20%</td>
<td>20%</td>
<td>5%</td>
</tr>
</tbody>
</table>

**Executive Chef Evaluation Circle level attained**

**Needs Improvement**

- Students do not complete lab plan
- Students have several safety violations.
- There are multiple errors in measuring techniques or more than two trips are made to the supply table and the supply table is left messy.
- Students are very disorganized and do not complete lab in allotted time. Several mistakes made in technique or equipment use. Students are distracting to others and/or outside appropriate work area.
- Students do not work well together. Some members do not do their share of the work. Some members quit before all work is completed.
- Finished product is unacceptable due to recklessness of students or table is set incorrectly.

**Beginner**

- Students do not include all required elements
- Students follow safety procedures; minor errors
- Students have several sanitation violations.
- There are two or more errors in measuring or sous chef makes more than one trip to the supply table.
- Students are very disorganized and/or make several mistakes in following the recipe. Students do not work quietly in their own lab station.
- Finished product is unacceptable due to honest mistakes of students.

**Proficient**

- Lab plan includes most required elements.
- Students follow safety procedures; minor errors
- Students follow sanitation procedures; minor errors
- There is only 1 error in measuring technique or tools.
- There is only one error in organization, following the recipe or use of equipment
- Students work well with all group members, and complete all tasks assigned on the lab plan.
- Finished product is acceptable and table is set correctly.

**Advanced**

- Lab plan is accurate and includes all required elements
- Students follow all safety procedures.
- Students follow all sanitation procedures.
- Tray is organized so that only one trip to the supply table is necessary. Ingredients are measured accurately and supply table is left clean.
- Students worked quietly and efficiently in their own lab station, following the recipe accurately and using correct tools and techniques.
- Students work well with all group members, complete all tasks assigned on the lab plan, and help others if needed.
- Finished product is of high quality and table is set correctly.

**Teacher Evaluation**

**Individual Deductions**

Name: ____________________

Reason for Deduction: ____________________

Name: ____________________

Reason for Deduction: ____________________

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Farm to School Georgia Organics

[Link to farmtoschool.georgiaorganics.org]

High School  GA Standards  🔝 20 min

#ohmysquash
Botany Male or Female Flowers —
Brooke Lewis-Slamkova
Apalachee High School Educator and Maple Park Homestead Farmer

Overview
This lesson will challenge students to explore plant life and identify characteristics that make flowers male or female. (Time Needed: 1-2 class periods plus time for flowers to fruit.)

Standards
• SBO3. Students will explore the structures and processes necessary for the mutual survival of plants and animals.
  1. Describe and relate plant structures (organs, tissues, cells, organelles) to plant processes (photosynthesis, respiration, transport, growth, reproduction, dispersal).
  2. Explore how flowering plants and animals have co-evolved in pollination, which confers genetic and evolutionary advantages.
  3. Explore how fruit and seed adaptations help promote dispersal, which prevents competition between plants and helps in colonization.

Objectives
• Students will understand that flowers are either male or female.
• Students will evaluate what makes the flowers different.
• Students will draw and label the flowers and their parts.

Materials
• Squash plants in bloom in the school garden or at a local farm.
• Diagram of male and female squash blossom
• Good images for male and female flowers
• Interesting technique for hand pollination
• Paper, clipboards, colored pencils

Outline
• Engage: Students will draw the squash flowers.
• Explore: Students will explore the differences they see.
• Explain: Teacher will explain the parts of the flower and how they aid in reproduction.
Botany Male or Female Flowers

Extend
Students can examine how to hand pollinate

Lesson Plan

• **Engage:** Start by taking students into the garden to draw the squash flowers. Have students choose a flower and draw it with all the detail they can. Provide color pencils, paper, and clipboards outside.

• **Explore:** Let the students explore the parts of the flower. Let them brainstorm what they think each part is called. Keep a running list on the board. Ask them to compare their drawings with their neighbor’s. What differences do they see? Are all the flowers the same?

• **Explain:** Teacher will explain the parts of the plants using either the textbook or the resources above. Students will label their flower parts. The teacher will then teach the difference in the male and female flowers and their role in reproduction. They will label their flower as male or female. They will then draw the other flower and label its part.

• **Extend:** Students can read the Seed Saver guide to hand pollination. They can go back out the garden and hand pollinate some plants. They leave one plant naturally pollinated.

• **Evaluate:** Students will monitor squash production to evaluate which plants were most productive, hand or open pollinated. They will present their findings on a graphic with an explanation of the process along with a diagram of the flowers in the hallway or garden.
World History and Science
The Three Sisters

Brooke Lewis-Slamkova
Apalachee High School Educator and Maple Park Homestead Farmer

Overview
This lesson will challenge students to understand how different civilizations influenced others and how agriculture, technology, and culture were transferred due to explorers and colonization. (Time Needed: 2 class periods with option to grow the three sisters plants in the school garden.)

World History Standards

• SSWH8 Describe the diverse characteristics of societies in Central and South America.
  1. Explain the rise and fall of the Mayan, Aztec, and Inca Empires.
  2. Compare and contrast the Mayan, Aztec, and Incan societies, include: religion, culture, economics, politics, and technology.

• SSWH10 Analyze the causes and effects of exploration and expansion into the Americas, Africa, and Asia.
  1. Explain the roles of explorers and conquistadors.
  2. Analyze the global, economic, and cultural impact of the Columbian Exchange.
  3. Explain the role of improved technology in exploration.
  4. Examine the effects of the Transatlantic Slave Trade on Africa and on the colonies in the Americas.

Science Standards

• SEV1. Obtain, evaluate, and communicate information to investigate the flow of energy and cycling of matter within an ecosystem.
  1. Develop and use a model to compare and analyze the levels of biological organization including organisms, populations, communities, ecosystems, and biosphere.
  2. Develop and use a model based on the Laws of Thermodynamics to predict energy transfers throughout an ecosystem (food chains, food webs, and trophic levels). (Clarification statement: The first and second law of thermodynamics should be used to support the model.)
  3. Analyze and interpret data to construct an argument of the necessity of biogeochemical cycles (hydrologic, nitrogen, phosphorus, oxygen, and carbon) to support a sustainable ecosystem.
Objectives:

- Students will understand how squash was carried from the new world back to Europe.
- Students will evaluate the effectiveness of traditional native growing techniques.
- Students will find plant and grow three crops using traditional methods versus conventional monoculture methods.
- Students will describe the global, economic, and cultural impact of the Americas.

Materials:

- Three Sisters Folklore
- Three Sisters.pdf (make enough for the class or post in Google Classroom)
- https://www.youtube.com/watch?v=kRLANoPbs1o
- https://www.history.com/topics/ancient-americas/aztecs
- The Domestication of Squash
- Domestication Hypothesis Map
- Order seeds from Rare Seeds or other heirloom seed companies that specialize in original seeds.
- Garden beds prepped for planting.
Outline:

- **Engage:** Students will learn about the three sisters in native folklore.
- **Explore:** Students will explore the traditional growing methods.
- **Explain:** Teacher will explain how current agricultural practices are studying the traditional methods for efficacy.
- **Extend:** Students can examine traditional versus conventional growing practices.

Lesson Plan

- **Engage**
  Start by showing students the Three Sisters Folklore edpuzzle. This can be done as a whole class activity or placed on Google classroom for students to watch individually or at home.

- **Explore**
  Let the students explore Aztec history using the two websites listed or their own research. The teacher will also guide them through the history of the Columbian exchange and its historical significance. Have them track the use of squash the Three Sisters pdf. They will have to use their knowledge of science and growing to synthesis the information. They can also explore Renee’s Garden and the Farm Project websites for simplified instructions.

- **Explain**
  Teacher will explain that students are being asked to evaluate how effective the traditional growing method is compared to sowing individual rows of each plant. The students will divide into groups and design an experiment that uses both traditional and conventional methods. Students will need to state a hypothesis and design the scientific experiment themselves. (Teachers may want to give them a predesigned experiment.)

- **Extend**
  Students will plant, tend, and harvest both traditional and conventional beds. They will use the scientific method to ensure that they are watering the same amount and keep as many variables consistent as possible. They will weigh and track harvest totals.

- **Evaluate**
  Students will evaluate the data and state if their hypothesis was correct.

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World History and Science
The Three Sisters

Brooke Lewis-Slamkova
Apalachee High School Educator and Maple Park Homestead Farmer

### GEORGIA ORGANICS

High School  GA Standards  20 min

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Overview

This lesson will challenge students to identify how food is grown and how they perceive fruits and vegetables in a persuasive essay about food and food culture. (Time Needed: 1-2 class periods with option to finish for homework or revise on their own time.)

Standards:

- LAGSE11-12RL1: Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain.
- d. Identify children at nutritional risk.
- ELAGSE11-12RL3: Analyze the impact of the author’s choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed).
- ELAGSE11-12RL4: Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful.
- ELAGSE11-12RL5: Analyze how an author’s choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact.
- ELAGSE11-12RI5: Analyze and evaluate the effectiveness of the structure an author uses in his or her exposition or argument, including whether the structure makes points clear, convincing, and engaging.
- ELAGSE11-12RL6: Analyze a case in which grasping point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement).
Objectives:

- Students will understand that food and people’s perspectives of food are influenced by their past experiences.
- Students will evaluate persuasive writing and identify effective techniques used.
- Students will identify opinions directly stated or underlying opinions.
- Students will create a letter to the author discussing questions that the reader has and their personal opinions about food.

Materials:

- Post or print this article by Barbara Kingsolver
- How to annotate a text
- Interesting look at persuasive essay and psychology
- Rubric for student writing

Outline:

- **Engage:** Students will brainstorm where their food comes from.
- **Explore:** Students will explore one author’s persuasive essay about food and food culture.
- **Explain:** Teacher will explain how psychology plays an important role in effective persuasive writing.
- **Extend:** Students can examine their own beliefs about food and food culture through personal letters.
Lesson Plan

• Engage: Start by asking students to describe their last meal and how it came to be on their plate. Give them five to ten minutes to free write about where their food comes from. Encourage them to get really creative and make things up if necessary.

• Explore: Let the students explore the article “Vegetannual” by Barbara Kingsolver. Have them annotate the text using the pdf in the materials. Have plenty of sticky notes, highlighters, colored pens, etc. available for them to use on the text. They can also use their phones to look up new words.

• Explain: Teacher will explain what persuasive texts are and how they are used. The article about persuasion and psychology is a great resource to share or paraphrase. Allow students to share their feelings about the work, questions about the text, and their thoughts on their own knowledge about where food comes from.

• Extend: Students will construct a letter to Barbara Kingsolver persuading her to do something. This could be to persuade her to write for children on this topic, to change her mind about how food is grown, or that food should be available year round. They should use evidence from her essay as support for their claim.

• Evaluate: Students’ letters will be evaluated with the rubric provided or with your school or class rubric for persuasive writing.

***This became a chapter in the book Animal, Vegetable, Miracle by Barbara Kingsolver. It’s an amazing book that high schoolers really enjoy. Consider making this into a book study or reading circle.

Brooke Lewis-Slamkova
Apalachee High School Educator and Maple Park Homestead Farmer

farmtoschool.georgiaorganics.org #ohmysquash
<table>
<thead>
<tr>
<th>Lesson Plan (LP)</th>
<th>Author: Hannah McTier</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course:</strong> Basic Agricultural Science (02.47100)</td>
<td><strong>LP Title:</strong> Squash Basics</td>
</tr>
<tr>
<td><strong>Estimated Time:</strong> 45 minutes</td>
<td><strong>Grade Level:</strong> 9th – 12th Grade</td>
</tr>
</tbody>
</table>

**Materials, Supplies, Equipment, References, and Other Resources:**

**Materials:** whiteboard with dry erase markers, Smartboard with projector, student access to internet or library, poster board, markers, colored pencils, crayons, note taking materials


**Standards:**

AFNR-BAS-13 Explain and demonstrate basic plant science principles including plant health, growth and reproduction.

13.1 Describe basic factors in plant growth.
13.2 Identify plant life cycles and list examples.
13.3 Label the major parts of the plant and explain functions of each plant part.

**Essential Questions/Objectives:**

The student will be able to…

1. Describe the four basic factors in squash plant growth by participating in an interest approach activity.
2. Identify the plant life cycle of a squash by participating in an interest approach activity.
3. Label the major parts of the squash plant and explain the functions of each squash plant part by participating in a plant part exploration and poster creation activity.
### Accommodations

For students with disabilities, the instructor should refer to the individual student’s IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student’s IEP. Frequent consultation with a student’s special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

### Interest Approach

<table>
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<th>Estimated Time: 5 minutes</th>
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Display a picture of a squash plant for the students to see. Ask the students to turn to a neighbor and write down the answers to the following two questions on a scratch sheet of paper. What four factors are the most important in the growth of a squash plant? When will the squash plant in the picture die? Give the students about 2 minutes to come up with their answers and then ask for a few volunteers to share theirs aloud with the class. The teacher should make note of these on the board and then condense the lists down to the correct answers. The four most important factors for growth are light, air, nutrients, and water. The plant will die within six months of it being planted because squash have an annual life cycle, meaning they only stay alive and reproduce for one growing season. Continue on by explaining that the students will be learning much more about squash plants today!

### Learning Activity 1

<table>
<thead>
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<th>Estimated Time: 30 minutes</th>
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**Instructor Directions/Materials/Teaching Procedure**

<table>
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<tr>
<th>Brief Content Outline</th>
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</table>

**Plant Part Exploration & Poster Creation**

- Separate students into groups
- Explain instructions
- Give access to technology or library for research
- Monitor tech use
- Give access to poster materials
- Have each group present
- Students in the audience should take notes as their peers present to prepare for an upcoming activity

Count the students off by 6, resulting in six groups with at least two students per group. Assign each group one of the following: root, leaf, stem, squash blossom, squash, squash seeds. It is now their job to find out as much as possible about their assigned plant part in direct relation to squash. There are many kinds of squash, so direct their exploration towards summer squash, like yellow squash, zucchini, and patty pan varieties.

Once they have gathered their data, they should create a poster about it and be prepared to orally present their findings to the class. All information gathered should be cited. Pictures should be drawn on the poster, as well, and each group member is required to contribute during the oral presentation. Everyone should take notes on the plant parts their peers researched and present so that each student has a comprehensive understanding of what all of the plant parts do.

*if there is access to technology, like Chromebooks, then the students could create a joint flyer about their plant part on their Google Drive and submit it electronically rather than on paper"
**Summary (Reflection)**

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</table>
| The teacher should have pictures pulled up on the projector of various squash plant parts. Have all of the students in the room stand. As you move through the pictures, have a student volunteer to name a fact they learned about that particular plant part during class that day. For example, if a picture of a squash stem is on the board, a student could say the stem is the method of transportation for all nutrients and water up and down the plant. Once a student has stated a correct fact, they may be seated. All students must give a fact related to a squash plant part before they can be seated. Most importantly, no facts may be repeated! If possible, only allow students to name facts about a plant part they did NOT research to make the summary activity more challenging. However, if you have students who are struggling, help them out by changing the picture to the plant part they did research or allow students to use the notes they took during the presentations of their peers’ posters.  
*if time is running out, skip showing the pictures, and verbally assign a plant part or allow students to choose which plant part they are going to share a fact about* |

**Assessment**

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<th>Estimated Time: 5 minutes</th>
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<tr>
<td><strong>Formative:</strong> For a ticket out the door, have students write down the four most important factors for squash plant growth, the type of plant life cycle all squash have, and one new fact they learned during class about squash plants.</td>
</tr>
<tr>
<td><strong>Summative:</strong> N/A</td>
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</table>
Lesson Plan (LP) | Author: Hannah McTier

Course: Basic Agricultural Science (02.47100)

LP Title: Squash Production Practices and their Sustainability

Estimated Time: 90 minutes (Two 45-minute class periods)

Grade Level: 9th – 12th Grade

Materials, Supplies, Equipment, References, and Other Resources:

Materials: class-wide access to technology or library for research purposes


Standards:

AFNR-BAS-12 Apply principles of environmental science as it relates to agricultural production and sustainability.

12.3 Compares and contrasts current production practices such as organic, naturally raised systems, and conventional agricultural production with regard to their sustainability.

Essential Questions/Objectives:

The student will be able to…

1. Compare and contrast current production practices used to grow squash by participating in a class discussion meet.
Accommodations

For students with disabilities, the instructor should refer to the individual student's IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

Interest Approach

Estimated Time: 10 minutes

Write the following three terms on the board: organic, certified naturally grown, and conventional. Allow the students to share out what they believe these terms mean and the implications of choosing to farm a certain way. When the discussion begins to wind down, assign students to three teams with the topic for each team being one of the terms listed above. Then, introduce the discussion meet assignment.

Learning Activity 1

Estimated Time: 35 minutes

Instructor Directions/Materials/Teaching Procedure

Preparing for the Discussion Meet

Go over rubric
Assign students to groups
Walk around the room and answer questions about opening/closing statements, rules, etc.

*I recommend changing the layout of the room. If you have desks, then create two circles, with the smaller circle being inside the larger circle. The students who will be actively arguing will sit in the middle, smaller circle, with the remainder of the class sitting around them observing.

Brief Content Outline

Explain that students will have a discussion-meet style debate over using organic, certified naturally grown, or conventional production practices to grow squash. Inform them that a discussion meet is not as formal as a debate, in that students will need to make sure they are speaking enough but not keeping other students from speaking. This element of the discussion meet, among others, will be addressed in the rubric.

Explain that students will need to follow the rubric to earn an appropriate participation grade for their performance. Students can have the remainder of class to do additional research and write their opening statement in support of their assigned production practice. The statement will need to include their position on the topic, as well as evidence on why they feel that way, and will need to be no longer than one minute. Inform the students that they will need to come prepared to participate in the discussion meet the next day. If they did not have enough time to gather information to support their argument, then they should continue their research at home or in the library after school.

For more information, visit https://georgiaorganics.org/for-schools/octoberfarmtoschoolmonth!
<table>
<thead>
<tr>
<th>Learning Activity 2</th>
<th>Estimated Time: 35 minutes</th>
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<tr>
<td><strong>Instructor Directions/Materials/Teaching Procedure</strong></td>
<td><strong>Brief Content Outline</strong></td>
</tr>
<tr>
<td><em>Discussion Meet</em></td>
<td>There will be three initial rounds of the discussion meet with the top student from each round moving on to the final round. Each individual round will be one of the three groups pitted against one another to determine the final representative for each group (i.e. all of the students charged with researching organic squash production practices will be pitted against one another to determine the groups’ spokesperson in the final discussion meet). The final round will consist of the top scoring student from each of the three categories. There will be three eight-minute discussion meet rounds. The winner of each round (3 total) will compete again in a final ten-minute round. Students will be scored on the given rubric based on the three initial rounds. Extra credit points should be awarded to the three students who make it to the final round. <em>Another method is to place at least 2 supporters from each group into the initial rounds (2 organic, 2 conventional, etc.) to argue and determine a winner that way before moving on to the final round. You cannot control what groups will make it to the final round with this method, though.</em></td>
</tr>
<tr>
<td>Go over rubric again</td>
<td><em>Discussion Meet</em></td>
</tr>
<tr>
<td>Walk around the room and answer remaining questions</td>
<td><strong>Discussion Meet</strong></td>
</tr>
<tr>
<td>Conduct discussion meet</td>
<td><strong>Discussion Meet</strong></td>
</tr>
<tr>
<td>Remind students to be polite and respectful of peers, especially those observing and not actively participating at the time</td>
<td><strong>Discussion Meet</strong></td>
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### Summary (Reflection) | Estimated Time: 10 minutes
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Have students create a summary statement based on what they learned about organic, certified naturally grown, and conventional production practices during the discussion meet to turn in before leaving class. Ask for some students to share their main takeaways and link it back to the interest approach discussion that was held at the beginning of the lesson. Do students still feel the same way they initially did? Have they changed camps? Is one production practice better or worse for growing squash? For people? For nature? Economically?

### Assessment

- **Formative**: Assign a formative grade based on student performance in the discussion meet. They will be graded on the given rubric and will also have the chance to earn bonus points based on their final ranking in the class.

- **Summative**: N/A
<table>
<thead>
<tr>
<th>TOPIC:</th>
<th>Participants’ Names</th>
<th>Participants’ Names</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total of 600 points possible.</td>
<td>Superior - 100&lt;br&gt;Excellent - 80&lt;br&gt;Good - 60&lt;br&gt;Fair - 40&lt;br&gt;Poor - 20</td>
</tr>
<tr>
<td>(1) Delivery: (100 points)</td>
<td>Voice quality, loudness, clear enunciation, communication skills. Interesting choice of words.</td>
<td></td>
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<tr>
<td>(2) Problem Solving and Implementation: (100 points)</td>
<td>Ability and judgement in seeking answers and solutions, planning and organizational understanding.</td>
<td></td>
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<tr>
<td>(3) Cooperative Attitude: (100 points)</td>
<td>A. Listening, asking pertinent questions, airing all points of view securing major agreement, minimizing major differences.&lt;br&gt;B. Courtesy to other participants, encourage discussion from other participants.</td>
<td></td>
</tr>
<tr>
<td>(4) Analysis of Topic or Problem: (100 points)</td>
<td>Does competitor attempt to identify problem causes and remain on topic? Knowledge, extent, and accuracy of facts.</td>
<td></td>
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<tr>
<td>(5) Opening Statement: (100 points)</td>
<td>Definition of problem, importance, causes, effects, relevancy of problem.</td>
<td></td>
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<tr>
<td>(6) Closing Statement: (100 points)</td>
<td>Ability to summarize discussion and formulate direction for the future.</td>
<td></td>
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<tr>
<td>TOTAL:</td>
<td>Total score for each student is to be tabulated by judge. Any tie scores are to be broken by judge.</td>
<td></td>
</tr>
<tr>
<td>RANK:</td>
<td>Rank competitors 1(highest)-6(lowest)</td>
<td></td>
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</tbody>
</table>
Lesson Plan (LP) | Author: Hannah McTier

**Course:** Basic Agricultural Science (02.47100)  
**LP Title:** The Needs of Squash Seeds  
**Estimated Time:** 45 minutes (will need to be revisited shortly for approximately 7 to 10 days)  
**Grade Level:** 9th – 12th Grade

**Materials, Supplies, Equipment, References, and Other Resources:**  
**Materials:** enough summer squash seed (yellow squash, zucchini, patty pan) for every student to have 2 seeds, class set of plastic sandwich bags and cotton balls, tape, permanent marker, window that gets sunlight, class set of seed germination observation charts, access to water, whiteboard with dry erase markers  

**Standards:**  
**AFNR-BAS-13** Explain and demonstrate basic plant science principles including plant health, growth and reproduction.  
13.10 Demonstrate scarification, stratification, and planting seeds.  
13.11 Outline germination steps and list conditions under which germination occurs.

**Essential Questions/Objectives:**  
The student will be able to…  
1. Demonstrate scarification, stratification, and planting of squash seeds by participating in a seed germination activity.  
2. Outline germination steps and list conditions under which germination occurs by observing the germination of a squash seed over time.
Accommodations

For students with disabilities, the instructor should refer to the individual student's IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

Interest Approach

Estimated Time: 5 minutes

Explain to the students that class today will be spent trying to determine what squash seeds truly need or like to have in order to sprout or germinate. Show students the following video of seeds germinating: https://www.youtube.com/watch?v=ECibetK2EYI (1:20). Once the video has ended, explain the process the students witnessed over and over again in the video was called germination, the process where a seed becomes a seedling. Then explain how everyone will get the chance to see this process in real life over the next week in class!

Learning Activity 1

Estimated Time: 30 minutes

Instructor
Directions/Materials/
Teaching Procedure

Seed Germination
Observations

Acquire all materials
Pass out materials
Give instructions
Walk around to answer questions
Offer advice on various types of growing environments students could choose
Remind everyone to fill in their germination observation chart
Return to the lesson for a brief time over the next 7 to 10 school days to allow students to finish making observations in their chart

Pass out a plastic sandwich bag (serving as container), cotton ball (serving as soil), and two seeds of the same variety to each student. Pass the permanent markers around and instruct each student to write their name on the bag as well as the type of seed they were given. Try to have at least 3 kinds of summer squash seed (yellow squash, zucchini, patty pan).

Tell the students to separate into groups based on the type of seed they were given. Each group will pick one person to be the control. The control person should write the word control on their bag. This person will dampen their cotton ball with water, place it inside the plastic bag, place the two seeds inside the bag up against the cotton ball, close the bag, and tape it to a class window that receives sunlight. The remainder of the group is encouraged to do something similar, but unique. For example, one person could dampen their cotton ball with dish soap instead while still following all of the other steps the control did or another could smash or scratch their seed, a method called scarification. After each person has decided on the type of growing environment they want to introduce their squash seed to, have them execute this, write a summary of this on their bag for easy identification later on, and tape their bags to the window.

Everyone in the class should create a chart based on the decisions each individual student makes. The chart should list the various types of squash seed being used and then the types of environments they were placed in. As time passes, all students in the class will be responsible for making observations of the germination process the seeds go through.
For this extension, you will need space and/or containers to plant in, as well as, permission if planting on school grounds.

It will take, at most, 10 days for the seeds to germinate, although some will not due to imperfections in the seed/the chosen planting environment. Because of this, water, soap, etc. may need to be added over time due to evaporation and absorption by the seeds.

*Once the seeds that are going to germinate do germinate, find a place outside where you can plant the new seedlings. The space could be in pots, it could be in the ground, or it could be in raised beds. Remember, do not separate the cotton ball from the root system because it will traumatize the plant – the cotton will eventually break down into the soil anyways after planting. Be sure to label what each plant is as you plant it so you can tell the difference between your varying species of squash. Depending on the number of survivors from your germination activity, the observation chart could be extended or expanded on to continue to make observations of any differences between the plants. For example, maybe the seed planted in soap did survive, but its’ seedling is growing much more slowly than the control.

**Summary (Reflection)**

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<th>Estimated Time: 10 minutes</th>
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The class should work to create a list stating the main requirements of the seeds to germinate. Examples should include light, water, air, and nutrients. Then create several hypotheses surrounding the various types of environments they choose to plant their seeds in. For example, we hypothesize the control seeds will sprout into a healthy seedling because it was given everything it needed to grow. Have the students write these hypotheses down on the backs of their seed germination observation chart and revisit them once the seeds have had enough time to germinate.

**Assessment**

**Formative:** Every student will be tasked with creating an environment for their seed to grow in. Creation of this environment is a formative assessment to ensure they are on task and participating.

**Summative:** N/A
Example Seed Germination Observation Chart

Germination is the process by which an embryo or seed changes into a seedling or growing plant. For germination to occur the following are necessary:

- Moisture
- Correct Temperature
- Air
- Some seeds need light, some don’t
- Some seeds need help by way of scarification, but some don’t

Germination Steps to look for and check off or date once seen:
1. Seed absorbs liquid and swells.
2. Water activates enzymes which help digest stored food and becomes energy.
3. Roots begin to grow.
4. Shoot emerges, eventually turning into stem and first leaves.

<table>
<thead>
<tr>
<th>Yellow Crookneck</th>
<th>Zucchini</th>
<th>Patty Pan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>Control</td>
<td>Control</td>
</tr>
<tr>
<td>1. 2. 3. 4.</td>
<td>1. 2. 3. 4.</td>
<td>1. 2. 3. 4.</td>
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<tr>
<td>Dish Soap</td>
<td></td>
<td>1. 2. 3. 4.</td>
</tr>
<tr>
<td>1. 2. 3. 4.</td>
<td>1. 2. 3. 4.</td>
<td>1. 2. 3. 4.</td>
</tr>
<tr>
<td>No water</td>
<td>1. 2. 3. 4.</td>
<td>1. 2. 3. 4.</td>
</tr>
<tr>
<td>Placed in Closet</td>
<td>1. 2. 3. 4.</td>
<td>1. 2. 3. 4.</td>
</tr>
<tr>
<td>Seed Scarred by Notching</td>
<td>1. 2. 3. 4.</td>
<td>1. 2. 3. 4.</td>
</tr>
<tr>
<td>Bag filled with water</td>
<td>1. 2. 3. 4.</td>
<td>1. 2. 3. 4.</td>
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</tbody>
</table>
Lesson Plan (LP) | Author: Hannah McTier
---|---
**Course:** Basic Agricultural Science (02.47100)  
**LP Title:** Vertical Farming with Squash  
**Estimated Time:** 45 minutes (project will need to be completed at home and also have more class time devoted to it once the designs are built and plants growing)  
**Grade Level:** 9th – 12th Grade

<table>
<thead>
<tr>
<th>Materials, Supplies, Equipment, References, and Other Resources:</th>
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| **Materials:** enough summer squash seed (yellow squash, zucchini, patty pan) for every student to have 2 seeds, access to water and an area to plant the seeds, myriad of building supplies dependent on the students’ garden designs, drawing materials  

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<thead>
<tr>
<th>Standards:</th>
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</table>
| **AFNR-BAS-12** Apply principles of environmental science as it relates to agricultural production and sustainability.  
12.4 Demonstrates how intensive production systems such as aquaculture and vertical farming can maximize production while minimizing space requirements. |

<table>
<thead>
<tr>
<th>Essential Questions/Objectives:</th>
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</table>
| The student will be able to…  
1. Demonstrate how vertical farming can maximize production while minimizing space requirements by building a vertical squash garden at school. |
**Accommodations**

For students with disabilities, the instructor should refer to the individual student's IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

<table>
<thead>
<tr>
<th>Interest Approach</th>
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<tbody>
<tr>
<td>Show the following video clip as an introduction to vertical farming: <a href="https://money.cnn.com/video/news/2018/02/07/plenty-indoor-vertical-farming.cnnmoney/index.html">https://money.cnn.com/video/news/2018/02/07/plenty-indoor-vertical-farming.cnnmoney/index.html</a>. Instruct students to pay special attention to what the crops are growing in and on. Explain to students that they will be designing their very own vertical farm to be built and tested at school.</td>
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<tr>
<th>Learning Activity 1</th>
<th>Estimated Time: 15 minutes</th>
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<tr>
<td><strong>Instructor Directions/Materials/Teaching Procedure</strong></td>
<td><strong>Brief Content Outline</strong></td>
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</table>
| **Vertical Structure Design**  
Have extra drawing materials ready for students  
Allow technology access if possible  
Remind them they must complete the building at home or before/after school by bringing in materials | This lesson is meant to be continued at home on the students’ own time or before/after school. The in-class portion of the lesson is meant to be an introduction for them to the task at hand – building a vertical farm on school grounds.  
Instruct each student to get out paper and pencil. If you have technology access, then they can also use that. The project is simple. Squash has rarely, if ever, been grown in vertical farms because of the size of the adult plants and weight of their fruit.  
Each student must build their own vertical structure to grow their squash plant on or in. They must do this at home and using materials that can be easily gathered from their household without having to buy any additional materials. Students will have a week or two to build their structure and bring it into class.  
Once they bring it in, they will place it over the squash plant they planted or plant their squash plant within it and, over time, the class will determine which structure was the best. Thus, coming to an overall conclusion about how they can implement vertical farming on school property in the future. |
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<tr>
<th>Learning Activity 2</th>
<th>Estimated Time: 20 minutes</th>
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<tr>
<td><strong>Instructor</strong></td>
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<tr>
<td><strong>Directions/Materials/Teaching Procedure</strong></td>
<td><strong>Brief Content Outline</strong></td>
</tr>
<tr>
<td><em>Planting the Garden</em></td>
<td>After students have had a little time to think about what kind of structure they are going to build, take them to where the garden will be. This can be in a greenhouse, in a raised bed, along a fence line, etc. – anywhere that was approved by the school ahead of time or already designated for planting.</td>
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<tr>
<td>Get permission to have a garden</td>
<td>Each student should stake out their own spot, plant their two seeds, and label their spot for future reference. Remind students that this is the space their structure will have to fit in and the plant will have to grow on or in the structure. The whole point of this exercise is to save space and increase fruit production, so be sure the students plant their seeds closer together than is advised on the seed packets. I suggest going ahead with the planting of the seed because it can take several weeks before the plant is big enough to trellis or transplant.</td>
</tr>
<tr>
<td>Have the area staked out where you will be planting</td>
<td>You can also start the seeds in small pots or seed trays for easy transplanting later. If students have ideas that involve planting the seed within the structure they create, this may be the best route for you.</td>
</tr>
<tr>
<td>Have signage ready to label each students’ plant with</td>
<td>*If space is limited or students struggle with the concept, consider allowing two or three students to work together rather than alone.</td>
</tr>
<tr>
<td>Have all digging and watering tools ready for use</td>
<td></td>
</tr>
<tr>
<td>Regularly water the plants as they grow in preparation for the structures to be placed</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary (Reflection)</th>
<th>Estimate Time: 5 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have students submit a rough sketch or summary of what they are planning to build to grow their squash plant on or in. They should submit this plan as a ticket out the door.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Formative:</strong> Assess the students’ creations as they bring them into class and assign them a participation or formative grade based on their efforts. Grant bonus points to the student whose design holds up the best in the end.</td>
</tr>
<tr>
<td><strong>Summative:</strong> N/A</td>
</tr>
</tbody>
</table>
Lesson Plan (LP) | Author: Hannah McTier
---|---
Course: Basic Agricultural Science (02.47100)
LP Title: What Nutrients does a Squash Plant Need?
Estimated Time: 45 minutes
Grade Level: 9th – 12th Grade

Materials, Supplies, Equipment, References, and Other Resources:

Materials: access to technology and/or library for research purposes and slide creation, SmartBoard with Projector

Standards:

AFNR-BAS-13 Explain and demonstrate basic plant science principles including plant health, growth and reproduction.
13.6 Explain the roles of essential plant nutrients for plant growth and reproduction.

Essential Questions/Objectives:

The student will be able to…
1. Explain the roles of essential plant nutrients for squash plant growth and reproduction by contributing to the creation of a slideshow on the 16 essential plant nutrients.

Accommodations

For students with disabilities, the instructor should refer to the individual student's IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.
### Interest Approach

**Estimated Time:** 5 minutes

Pull up a picture of a nutrient deficient squash plant on the projector for all students to see. Engage students by asking what they think is wrong with the plant. Why does it look the way it does? Is it dying? Can the symptoms be remedied? Explain to the students the plant they see has a nutrient deficiency and that, yes, it can be saved as long as all of the necessary nutrients are provided to it.

### Learning Activity 1

**Estimated Time:** 20 minutes

<table>
<thead>
<tr>
<th>Instructor Directions/Materials/Teaching Procedure</th>
<th>Brief Content Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Essential Plant Nutrient Research and Slide Creation</strong></td>
<td>There are 16 essential plant nutrients: Carbon, Nitrogen, phosphorus, Hydrogen, Oxygen, Potassium, Iron, Magnesium, Calcium, Sulfur, Manganese, Molybdenum, Chlorine, Copper, Boron, Zinc – assign each nutrient to either a single student or to a pair of students.</td>
</tr>
<tr>
<td>Assign nutrients</td>
<td>The students are tasked with finding out what exactly their assigned nutrient does to help a squash plant grow and remain healthy. Does it help the seed store energy, assist in fruit production, contribute to plant growth, etc.?</td>
</tr>
<tr>
<td>Monitor computer usage</td>
<td>The students must quickly find this out and create one PowerPoint slide on their nutrient and submit it to the teacher (I recommend Google Slides for this). Because this is such a quick exercise, I would not worry about the overall look of the slide, but the information presented.</td>
</tr>
<tr>
<td>Walk around the room and answer questions</td>
<td></td>
</tr>
<tr>
<td>Encourage pictures and artistic slides if students have time</td>
<td></td>
</tr>
<tr>
<td>Compile the slides into one slideshow</td>
<td></td>
</tr>
</tbody>
</table>

### Learning Activity 2

**Estimated Time:** 15 minutes

<table>
<thead>
<tr>
<th>Instructor Directions/Materials/Teaching Procedure</th>
<th>Brief Content Outline</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Review of Essential Plant Nutrient Slideshow</strong></td>
<td>Once all of the slides have been submitted and compiled into one slideshow, work through the slideshow with the class. Have each individual or pair of students stand up to recite what they discovered on their nutrient and how it contributes to a healthy squash plant.</td>
</tr>
<tr>
<td>Encourage note-taking</td>
<td></td>
</tr>
<tr>
<td>Be wary of inaccurate data</td>
<td></td>
</tr>
<tr>
<td>Share slideshow with class</td>
<td></td>
</tr>
</tbody>
</table>

### Summary (Reflection)

**Estimated Time:** 5 minutes

Show the picture of a nutrient deficient squash plant to the class again. Ask them now what they believe to be wrong with the plant and how to remedy that problem. Teach the students the following phrase as a way of remembering all 16 essential plant nutrients: C HOPKNS CaFe Mg B Mn CuZn ClMo > C. Hopkins Café Managed By My Cousin Clomo
Assessment

**Formative:** Assign a formative grade based on student participation in the research and slide creation activity. Every student should participate.

**Summative:** N/A

For more information, visit https://georgiaorganics.org/for-schools/octoberfarmtoschoolmonth!
Lesson Plan (LP) | Author: Hannah McTier

Course: General Horticulture & Plant Science (01.46100)

LP Title: A Squash Plants’ Worst Enemy: Insects

Estimated Time: 45 minutes (can be extended to two class periods)

Grade Level: 9th – 12th Grade

Materials, Supplies, Equipment, References, and Other Resources:

Materials: whiteboard with dry erase markers, Smartboard with projector, student access to internet or library, paper, colored pencils, rulers, markers, scissors, Wanted Pest Flyer rubric


Standards:

AG-GHPS-10 Evaluate the damage caused to plants by insects, weeds, diseases, and physiological disorders.

10.1 Identify common insects, weeds, diseases and physiological disorders.

10.2 Diagram the external structure of an insect.

10.3 Illustrate the complete and incomplete life cycles of insects.

10.4 Describe the damage inflicted by insects and weeds.

10.6 Identify the proper methods of controlling pests.
### Essential Questions/Objectives:

The student will be able to…

1. Identify common insects after creating a Wanted poster on an assigned pest describing the details of its’ existence and viewing other students’ posters.
2. Diagram the external structure of an insect after creating a Wanted poster on an assigned pest describing the details of its’ existence.
3. Illustrate the complete and incomplete life cycles of insects after creating a Wanted poster on an assigned pest describing the details of its’ existence.
4. Describe the damage inflicted by insects to squash plants after creating a Wanted poster on an assigned pest describing the details of its’ existence.
5. Identify proper methods of controlling squash pests after creating a Wanted poster on an assigned pest describing the details of its’ existence.

### Accommodations

For students with disabilities, the instructor should refer to the individual student’s IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student’s IEP. Frequent consultation with a student’s special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

### Interest Approach

**Estimated Time: 10 minutes**

Pull up the following kahoot link: https://create.kahoot.it/details/d64f69f3-01db-481c-996f-c254c3a5138f

It will take you to a pre-made kahoot showing students pictures of various insects asking them to determine what the insect is and whether it is beneficial or a pest. Allow the class to vote on each answer and then see how you all did as a group at the end! Explain to the students you will be learning more about the true pests that attack squash plants today!

### Learning Activity 1

**Estimated Time: 30 minutes**

**Instructor Directions/Materials/Teaching Procedure**

**Brief Content Outline**

Assign individuals or small groups of students an insect deemed a pest of squash plants. The following are suitable insects: Cucumber Beetle, Spider Mite, Melon Aphid, Squash Bug, Squash Vine Borer, Pickleworm, Squash Beetle

Assign the following information about the pest by hand or on the computer:

- Common and Scientific name
- Life cycle
- Anatomy
- Diet
- Enemies
- Habitat
- Range
- How farmers can get rid of it, etc.

They may do this by hand or on the computer, but they will need access to the computers or a library to research their information first.
### Summary (Reflection) | Estimated Time: 5 minutes
---|---
Verbally quiz students on the various types of insects that were showcased in the Kahoot game at the beginning of the class and be sure to include some of the squash-specific pests mentioned in the lesson. Test them to see if they can tell the difference between insects that are beneficial versus pests.

### Assessment
**Formative:** Students will be informally assessed based on their creation of a Wanted poster.

**Summative:** N/A
Name ________________________  Date ________________________
Pest ___________________________

**Wanted Pest Poster Rubric**

<table>
<thead>
<tr>
<th>Coverage of the Topic (40 points)</th>
<th>Below Average</th>
<th>Average</th>
<th>Above Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flyer includes little to no information about the chosen topic, the student failed to gain any true understanding of the material</td>
<td>Flyer includes information about the chosen topic, but may be too general or not as well researched as the above average category displaying only a surface level understanding of the material</td>
<td>Flyer includes the pests’ common and scientific names, anatomy, life cycle, diet, enemies, habitat, range, and any other interesting facts the student would like to include showcasing why this insect is a pest</td>
<td></td>
</tr>
</tbody>
</table>

| Design (30 points) | Missing relevant images, no title, colors are hard to read | Flyer includes various colors that are easy to read, good title, may be missing relevant images | Flyer includes various colors that are easy to read, great title, as well as relevant images |
|--------------------|------------------------------------------------------------|---------------------------------------------------------------|

| Mechanics (10 points) | Text is illegible, major spelling and grammatical errors, no sources cited | Text should be mostly legible, minor spelling and grammatical errors, only some of the sources are cited | Text is legible, no spelling or grammatical errors, all sources cited |
|-----------------------|---------------------------------------------------------------|---------------------------------------------------------------|

| Overall Effort (20 points) | Little to no effort was put into activity | Student completed the activity, but not to the best of their ability | Student was enthusiastic, engaged, and tried to complete the activity to the best of their ability |
|---------------------------|---------------------------------------------|---------------------------------------------------------------|

**Score:**

**Comments:**
Name ________________________  Date ________________________
Pest _________________________________________

**Wanted Pest Poster Rubric**

<table>
<thead>
<tr>
<th></th>
<th>Below Average</th>
<th>Average</th>
<th>Above Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coverage of the Topic</td>
<td>Flyer includes little to no information about the chosen topic, the student</td>
<td>Flyer includes information about the chosen topic, but it may be too</td>
<td>Flyer includes the pests’ common and scientific names, anatomy, life cycle, diet, enemies, habitat, range, and any other interesting facts</td>
</tr>
<tr>
<td>(40 points)</td>
<td>failed to gain any true understanding of the material</td>
<td>general or not as well researched as the above average category</td>
<td>the student would like to include showcasing why this insect is a pest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>displaying only a surface level understanding of the material</td>
<td></td>
</tr>
<tr>
<td>Design</td>
<td>Missing relevant images, no title, colors are hard to read</td>
<td>Flyer includes various colors that are easy to read, good title, may</td>
<td>Flyer includes various colors that are easy to read, great title, as well as relevant images</td>
</tr>
<tr>
<td>(30 points)</td>
<td></td>
<td>be missing relevant images</td>
<td></td>
</tr>
<tr>
<td>Mechanics</td>
<td>Text is illegible, major spelling and grammatical errors, no sources cited</td>
<td>Text should be mostly legible, minor spelling and grammatical errors,</td>
<td>Text is legible, no spelling or grammatical errors, all sources cited</td>
</tr>
<tr>
<td>(10 points)</td>
<td></td>
<td>only some of the sources are cited</td>
<td></td>
</tr>
<tr>
<td>Overall Effort</td>
<td>Little to no effort was put into activity</td>
<td>Student completed the activity, but not to the best of their ability</td>
<td>Student was enthusiastic, engaged, and tried to complete the activity to the best of their ability</td>
</tr>
<tr>
<td>(20 points)</td>
<td></td>
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</tr>
</tbody>
</table>

**Score:**

**Comments:**
Lesson Plan (LP) | **Author:** Hannah McTier

| **Course:** General Horticulture & Plant Science (01.46100) |
| **LP Title:** Diseases Common in Squash Plants |
| **Estimated Time:** 90 minutes (2, 45-minute class periods) |
| **Grade Level:** 9th – 12th Grade |

### Materials, Supplies, Equipment, References, and Other Resources:

**Materials:** whiteboard with dry erase markers, Smartboard with projector, student access to internet or library, Disease Presentation rubric, ammonia or lye, 1 cup of water per student, phenolphthalein


### Standards:

**AG-GHPS-10** Evaluate the damage caused to plants by insects, weeds, diseases, and physiological disorders.

1. Identify common insects, weeds, diseases and physiological disorders.
2. Describe common plant diseases and compare and contrast solution methods.
3. Identify the proper methods of controlling pests.

### Essential Questions/Objectives:

The student will be able to...

1. Identify diseases common in summer squash by working in a group to research and deliver a presentation on an assigned disease.
2. Describe plant diseases common in summer squash and compare and contrast solution methods by working in a group to research and deliver a presentation on an assigned disease.
3. Identify the proper method for controlling diseases common in summer squash by working in a group to research and deliver a presentation on an assigned disease.
Accommodations

For students with disabilities, the instructor should refer to the individual student's IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

Interest Approach

**Estimated Time:** 10 minutes

1. Ask for a volunteer, and then invite the volunteer to take a drink from either of two glasses of water. Tell the students that you spit into one glass before class. Discuss the responses. Why wouldn't you want to drink water someone else had spit in? Make the point that disease-causing organisms are found all around us, even in our water.
2. Continue the exploration by indicating that the class is going to play a "kissing game." Distribute the pre-prepared cups of water to each member of the class. (Prior to class time, add 1/8 teaspoon of ammonia or lye to two of the glasses of water. CAUTION: Warn students to not taste any of the samples.) Each student should have a cup of water.
3. Indicate that you are going to exchange water from the cups ("kiss"). The procedure is to allow someone to pour some water from their glass into yours. For each amount added, each individual must pour this amount into another person's glass. Continue this exchange for three minutes.
4. After the water exchange, indicate that two of the cups contained germs (represented by ammonia or lye). As with most microorganisms these germs are not easily seen, but they can be detected with a chemical indicator. Speculate on how far you think the germs were spread during the three minutes.
5. Add a few drops of phenolphthalein to each glass. If the germ (ammonia or lye) is present, the water will change color. Those with colored water will have been infected.
6. Discuss the results. Explain to students that in the following lesson, they will learn more about disease-causing microorganisms and how they can devastate plants.

Learning Activity 1

**Estimated Time:** 30 minutes

**Instructor Directions/Materials/ Teaching Procedure**

**Brief Content Outline**

**Squash Disease Presentation Creation & Presentation**

Assign groups
Monitor computer usage
Maintain order
Instruct students to take notes during the presentations

Students will be divided into groups of 2 or 3 and assigned a disease common to squash plants in Georgia. The following are appropriate diseases for summer squash: Bacterial Wilt, Powdery Mildew, Downy Mildew, Gummy Stem Blight, Anthracnose, Alternaria Leaf Spot, Cercospora Leaf Spot, Fusarium Wilt, Blossom-End Rot, etc.

Each group will research their disease using computers or the library and create a presentation on it using Google Slides or PowerPoint. Presentations should include but are not limited to the following information: common and scientific names, plants impacted, symptoms, origin, history, how it’s spread, how it’s cured, etc.

They will turn this presentation in on Google Classroom or by email. Each student should contribute to the creation of the presentation.
Remind students to cite their sources! Each group will present their disease presentation to the class. Students in the crowd are responsible for taking notes and being respectful of their peers. The rubric for the presentation is found below.

<table>
<thead>
<tr>
<th>Summary (Reflection)</th>
<th>Estimated Time: 5 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>As a ticket-out-the-door, ask students to write down one new and interesting fact they learned about one of the diseases their classmates presented on.</td>
<td></td>
</tr>
</tbody>
</table>

**Assessment**

**Formative:** Students will be informally assessed based on the group disease presentations.

**Summative:** N/A
Squash Disease Presentation Rubric

The plant disease presentations will be completed in small groups. Each group will be responsible for creating a presentation on an assigned squash plant-related disease and then teaching the class about it by presenting to the class. All presentations should be created on PowerPoint or Google Slides then submitted on Google Classroom or by email. Please use the rubric to assist in the development of your presentation!

<table>
<thead>
<tr>
<th>Possible Points</th>
<th>Final Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description of the Disease (common name, scientific name, symptoms, plants impacted, origin, history, how it’s spread, how it’s cured, etc.)</td>
<td>40</td>
</tr>
<tr>
<td>Creativity and Quality of Physical Presentation</td>
<td>20</td>
</tr>
<tr>
<td>Quality of Verbal Presentation</td>
<td>20</td>
</tr>
<tr>
<td>Inclusion of All Team Members</td>
<td>10</td>
</tr>
<tr>
<td>Overall Effort</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total Points</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Group 1: 

Group 2: 

Group 3: 

Group 4: 

Group 5:
<table>
<thead>
<tr>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 6</td>
</tr>
<tr>
<td>Group 7</td>
</tr>
<tr>
<td>Group 8</td>
</tr>
<tr>
<td>Group 9</td>
</tr>
<tr>
<td>Group 10</td>
</tr>
</tbody>
</table>
Lesson Plan (LP) | Author: Hannah McTier
---|---
**Course:** General Horticulture & Plant Science (01.46100)  
**LP Title:** Nutrient Deficiencies in Squash Plants  
**Estimated Time:** 45 minutes  
**Grade Level:** 9th – 12th Grade

**Materials, Supplies, Equipment, References, and Other Resources:**

**Materials:** whiteboard with dry erase markers, Smartboard with projector, access to library or computers for research purposes, paper, colored pencils, markers, crayons, tape  

**Standards:**

AG-GHPS-8 Identify macro, secondary and micro plant nutrients.  
8.1 List and discuss the nutrients needed for plant growth.  
8.2 Categorize common nutrient deficiency symptoms.

**Essential Questions/Objectives:**

The student will be able to…

1. List and discuss the nutrients needed for plant growth by participating in an interest approach/class discussion and completing a nutrient deficiency drawing activity.  
2. Categorize common nutrient deficiency symptoms by completing a nutrient deficiency drawing activity.
**Accommodations**

For students with disabilities, the instructor should refer to the individual student's IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

**Interest Approach**

Ask students to name as many of the nutrients necessary for plant growth as possible. List their answers on the board and fill in any blanks. Ask the students to describe what plants look like when they lack any of these nutrients. If they don’t know, then explain that they will find out today!

**Learning Activity 1**

**Estimated Time:** 30 minutes

**Instructor**

*Directions/Materials/Teaching Procedure*

<table>
<thead>
<tr>
<th>Nutrient Deficiency Drawing Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have all supplies prepped</td>
</tr>
<tr>
<td>Plan to have computers in the classroom for students to use or a scheduled visit to the library for research</td>
</tr>
</tbody>
</table>

**Brief Content Outline**

Assign each student one of the 16 essential nutrients. They then must research what a squash plant would look like if it were deficient of said nutrient and draw/color a picture of the plant to display in the classroom.

They should have the drawing on one side of the paper and the name of the nutrient deficiency plus other symptoms of the same deficiency written on the other side of the paper, along with their name.

*This lesson plan would pair well with the What Nutrients Does a Squash Plant Need? lesson plan that was released alongside this lesson plan.

**Summary (Reflection)**

**Estimated Time:** 10 minutes

Once everyone’s drawings are complete, have the students hang up their pictures around the room. Go to each drawing and poll the class on what type of nutrient deficiency the squash plant is experiencing. Once the answers are in, read the back of the drawing to see who was right. Be sure to go over the correct answer and other symptoms that could represent the same nutrient deficiency.

**Assessment**

**Formative:** Assess students understanding of nutrient deficiencies by keeping track of their correct/incorrect answers during the summary activity.

**Summative:** N/A
<table>
<thead>
<tr>
<th>Lesson Plan (LP)</th>
<th>Author: Hannah McTier</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course:</strong> General Horticulture &amp; Plant Science (01.46100)</td>
<td></td>
</tr>
<tr>
<td><strong>LP Title:</strong> Squash Irrigation Methods</td>
<td></td>
</tr>
<tr>
<td><strong>Estimated Time:</strong> 45 minutes</td>
<td></td>
</tr>
<tr>
<td><strong>Grade Level:</strong> 9th – 12th Grade</td>
<td></td>
</tr>
</tbody>
</table>

**Materials, Supplies, Equipment, References, and Other Resources:**

- **Materials:** whiteboard with dry erase markers, Smartboard with projector, newspapers, paper cups, plastic cups, plastic straws, glass jars, cardboard, bowls, clay, aluminum foil, glue, toothpicks, tape, rubber bands, paper clips, water, sink, paper towels

**Standards:**

- **AG-GHPS-12** Describe various plant irrigation methods.
  - 12.1 Explain the different types of watering methods for plants.
  - 12.2 Compare and contrast the advantages and disadvantages of each type of watering system.

**Essential Questions/Objectives:**

The student will be able to…

1. Explain the different types of watering methods for squash plants by participating in a popcorn reading activity.
2. Compare and contrast the advantages and disadvantages of each type of watering system by participating in a popcorn reading activity and irrigation building activity.

For more information, visit [https://georgiaorganics.org/for-schools/octoberfarmtoschoolmonth](https://georgiaorganics.org/for-schools/octoberfarmtoschoolmonth)!
**Accommodations**

For students with disabilities, the instructor should refer to the individual student's IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

<table>
<thead>
<tr>
<th>Interest Approach</th>
<th>Estimated Time: 10 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pull up the following link on the overhead projector: <a href="https://www.cdc.gov/healthywater/other/agricultural/types.html">https://www.cdc.gov/healthywater/other/agricultural/types.html</a>. Have students complete a popcorn reading of the 8 types of irrigation methods listed. Afterwards, discuss how the students will have the opportunity today to build their own irrigation system and should use the methods they just read about as inspiration for their designs. Remind them that their irrigation system should be built with squash plants in mind.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning Activity 1</th>
<th>Estimated Time: 25 minutes</th>
</tr>
</thead>
</table>
| **Instructor**
**Directions/Materials/Teaching Procedure** | **Brief Content Outline** |
| **Irrigation Building Activity**
- Have all materials prepped
- Walk around the room and answer questions as needed
- Check off drawings
- Remind students to return materials they are not using to the supply table
- Observe completed systems | Have all building materials set on one table in the room. Instruct students to get into small groups and assign one person as their runner. It will be that person’s job alone to gather materials from the supply table and return them when done using them.
- Each group is tasked with building an irrigation system that can move 1 cup of water a distance of 2 feet with the water being split equally into 2 containers. Once students are in their groups and understand the goal of building their own irrigation system, have them talk with one another and draw up a plan for their system. Once they are ready, the teacher should check their drawing for understanding before they are released to begin building. |

<table>
<thead>
<tr>
<th>Summary (Reflection)</th>
<th>Estimated Time: 10 minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Have each small group present the irrigation method their system most closely resembles and explain why they chose to build their system that way, pros, cons, etc.</td>
<td></td>
</tr>
</tbody>
</table>

**Assessment**

**Formative:** Evaluate the students on their hand-built irrigation systems and responses during their oral presentation of their systems for comprehension of irrigation methods.

**Summative:** N/A

For more information, visit [https://georgiaorganics.org/for-schools/octoberfarmintheschoolmonth](https://georgiaorganics.org/for-schools/octoberfarmintheschoolmonth)!
Lesson Plan (LP) | Author: Hannah McTier
---|---
**Course:** General Horticulture & Plant Science (01.46100)  
**LP Title:** The Sexual Propagation of Squash  
**Estimated Time:** 45 minutes  
**Grade Level:** 9th – 12th Grade

**Materials, Supplies, Equipment, References, and Other Resources:**

**Materials:** whiteboard with dry erase markers, Smartboard with projector, newspaper, permanent markers, plastic sandwich bags or glass jars with lids, paper plates, kitchen knife, several hardened summer squash (reach out to local farmer – they all throw these over-ripened squash away), access to sink and water  
[http://blog.seedsavers.org/blog/zucchini-tips](http://blog.seedsavers.org/blog/zucchini-tips),  

**Standards:**

**AG-GHPS-5** Discuss the importance of sexual reproduction in plants.  
  5.1 Examine the importance of plant propagation.  
  5.2 Compare and contrast sexual and asexual propagation.

**Essential Questions/Objectives:**

The student will be able to…
  1. Examine the importance of plant propagation by participating in the interest approach class discussion and seed saving activity.  
  2. Compare and Contrast sexual and asexual propagation by participating in the interest approach class discussion.
Accommodations

For students with disabilities, the instructor should refer to the individual student's IEP to insure the accommodations specified in the IEP are being provided within the classroom setting. Instructors should familiarize themselves with the provisions of Behavior Intervention Plans that may be part of a student's IEP. Frequent consultation with a student's special education instructor will be beneficial in providing appropriate differentiation within any given instructional activity or requirement.

Interest Approach

Write the following on the board: sexual propagation vs asexual propagation. Instruct the students to discuss in pairs or small groups what they think each of the phrases means and the differences between the two. After 2 or 3 minutes of discussion, have a few volunteers share out some of their conclusions and make a list on the board of the correct answers. Leave the list on the board for the remainder of the class period. Before moving into the lesson, be sure to stress to students that summer squash plants undergo sexual propagation (AKA have to be planted with seed) and that the students will be engaging in a seed saving activity today which is the first true step that must be taken before planting can occur.

Learning Activity 1

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**Instructor Directions/Materials/Teaching Procedure**

**Squash Seed Saving Activity**

Plan ahead to have enough hardened summer squash – they must harden on the plant, not after being picked so store bought won’t work
Have all materials prepped Monitor safe knife usage
Walk around class to monitor and help when needed

*Try engaging the students in deeper discussion on sexual vs asexual propagation as they work to save seeds

**Brief Content Outline**

Pass out the hardened yellow squash and zucchini to pairs or small groups of students, depending on the number of squash you have. Pass out newspaper and instruct the students to cover their desks with the paper to make for easy clean-up. Pass out a paper plate to each small group and a small plastic bag/glass jar and lid with a permanent marker.

Instruct the students to write the date, source, and type of squash they have on their paper plates and plastic bags/glass jar and lid.

Review knife safety and allow the students to slice their squash open long ways (the teacher can do this if they are worried about safety). Have the students scoop out all of the seed they can and avoid the fruits’ flesh as much as possible.

Wash all of the flesh from the seeds and place them in a single layer on each of the appropriately labeled paper plates. Leave them for a week to completely dry out before placing them into their plastic bags/glass jars for storage in a cool, dry place.

*Consider using this seed in The Needs of Squash Seeds or Vertical Farming with Squash lesson plans that were released alongside this lesson plan
Summary (Reflection) | Estimated Time: 5 minutes
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Erase the board if the information from the interest approach is still written on it. Have the students write down in their own words the differences between sexual and asexual propagation and which they think is the best for growing plants. Have them turn in their written responses as a ticket-out-the-door.

Assessment

**Formative:** Assess the students understanding of propagation by reviewing their ticket-out-the-door responses.

**Summative:** N/A