CPCS Ag-STEM Interdisciplinary Summer Camp Plan

Overview

As outlined below, students will participate in a variety of activities during a 5-day Ag-STEM summer camp, in which they grow their knowledge of and appreciation for agriculture. Additionally, students will have daily practice with STEM (science, technology, engineering, and math) concepts and will strengthen their English Language skills. Both native speakers and English Language Learners need daily opportunities to practice the four domains of language as addressed in state standards (SWRL: speaking, writing, reading, and listening). Each day's lessons reinforce concepts from state standards grades 3-5.

Speaking: Students will share ideas with the whole group through morning meetings, collaborative small group activities, and journal sharing.
Writing: Students will use science journals throughout the day to record observations and at the end of the day as a reflection tool.
Reading: A daily reading comprehension practice activity is embedded each day.
Listening: Students will participate in morning meetings and collaborative groups to gain active listening skills.

Day 1 Overview
Activities and Learning Goals **1. Morning Meeting** Students will collaborate to establish ground rules and activate prior knowledge related to gardening. **2. Making a Science Journal** Students will create science journals in order to record observations and reflections throughout the week. **3. Nature Scavenger Hunt** Students will observe nature using the senses and record observations. **4. Time in the Garden** Students will participate in real world gardening experiences.

5. Create Your Own Garden (STEM Design Project) Day 1
Students will apply concepts of area and perimeter to a real-world gardening design scenario.

6. Garden in a Glove
Students will investigate the life cycle of a plant.

7. Journal Reflection
Students will write informative writing samples as they reflect on the day's learning experiences.

Today's Literacy Connection
Students will interact with a nonfiction read aloud text (Perimeter, Area, and Volume: A Monster Book of Dimensions) to demonstrate comprehension.

Today's STEM connection
Students calculate perimeter and area in a real-world garden design project.

Day 1 Materials:

Teacher Materials:
*chart paper & markers
*picture of a garden (can be local or a digital picture)
*Book: Perimeter, Area, and Volume: A Monster Book of Dimensions by Edward Mill and David A. Adler
*Computer with projection and audio

Student Materials:
*colored paper (at least 6 sheets per child)
*scissors
*glue/glue sticks
*colored pencils
pencils/erasers
*100 paper clips for each student
*Centimeter graph paper
*Clear plastic glove (1 for each student)
*5 types of seeds: possible options include: lima beans, cucumber seeds, marigold seeds, pumpkin seeds, peas, zinnias)

*hand lens
*5 cotton balls per student
*Spray bottle with water
*Sharpies
*Tape (scotch tape and masking tape both work)
*optional: student devices for taking photos
*optional: flexible tape measures (one for each pair of students)
*optional: Meter stick or yard stick (one for each pair of students)

Student Handouts:

*Copy of scavenger hunt for each student
*Create Your Own Garden Worksheet

Day 2 Overview

Activities and Learning Goals

1. **Morning Meeting**

Students will build relationships to promote socio-emotional development.
Students will explore facts to deepen their understanding of agriculture in the US.

2. **Time in the Garden**

Students will participate in real world gardening experiences.

3. **Soil Tour**

Students will compare types of soil by their properties and components.

4. **Create Your Own Garden (STEM Design Project Day 2)**

Students will develop computational fluency through a real-world garden budgeting exercise.

5. **Science experiment: Carnation Colors**

Students will explore the function of a plant's stem through experimental observation.

6. **Journal Reflection**

Students will write informative writing samples as they reflect on the day's learning experiences.

Today's Literacy Connection

Students will interact with a nonfiction text by reading about soil types and participating in an academic discussion based on the text.

Today's STEM connection
Students will participate in a real-world design project using computational fluency to calculate a budget.

Materials Needed

Teacher Materials:
*Computer with projection and audio
*Chart paper and markers
*rules chart paper from yesterday
*Ag Q&A cards resource (cut prior to the meeting)

Students Materials:
*scotch tape
*journals/pencils
*hand lens
*samples of sand, clay, and silt in paper cups
*Paper plates
*Toothpicks
*Dropper/pipette
*Small cup of water
*chart paper/marker
*garden on graph paper from yesterday
*devices for accessing the internet
*colored pencils
*a cut white carnation for each group/pair of students
*vase or tall cup to hold water for each group/pair of students
*food coloring
*optional: calculators

Student Handouts:
*Types of Soil reading
*Create Your Own Garden Worksheet

Day 3 Overview

Activities and Learning Goals

1. **Morning Meeting**

Students will build relationships to promote socio-emotional development.
Students will review content specific vocabulary related to agriculture.

2. **Water investigations**

Students will explain the water cycle using texts and a hands-on investigation.

3. **Time in the Garden/Virtual Garden**

Students will participate in real world gardening experiences, either in a container garden or virtual.

4. **Design Project: Irrigation System:**

Students will define problems and develop solutions to address a real world problem.

5. **Journal Reflection**

Students will write informative writing samples as they reflect on the day's learning experiences.

Today's Literacy Connection
Students will interact with a nonfiction read aloud text and demonstrate comprehension through a guided discussion.

Today's STEM connection
Students will develop and design a solution to a real-world problem (irrigation of house plants).
Students will explain the water cycle and the role plants play in the water cycle.

Materials Needed

Teacher Materials:
*rules chart paper from Monday
*Computer with projection and audio
*Chart paper and markers
*All the Water in the World in the World by George Ella Lyon (picture book)

Students Materials:
*Masking tape
*Gallon size plastic bags

*Small clear 6 oz plastic cups
*food coloring
*Sharpie
*biodegradable seed starter peat pots
*potting soil
*seeds of your choice
*plastic tubing with syringe (similar to this)
*clear plastic cups
*push pins
*small water bottles
*journals and pencils

Student Handouts:
None

Day 4 Overview

Activities and Learning Goals

1. **Morning Meeting**

Students will build relationships to promote socio-emotional development.
Students will review content specific vocabulary related to the water cycle.

2. **Leaf Identification Activity**

Students will develop observation skills using natural materials.

6. **Time in the Garden/Virtual Garden**

Students will participate in real world gardening experiences, either in a container garden or virtual.

3. **Model of a Flower**

Students will identify and describe the structure and function of plant parts though modeling (roots, stem, leaves, etc.)

4. **Dissecting a Flower:**

Students will identify and describe the structure and function of plant parts though dissection (roots, stem, leaves, etc.)

5. **Flowers and Bees:**

Students will describe the interdependence of bees and plants in an ecosystem.

6. **Journal Reflection:**

Students will write informative writing samples as they reflect on the day's learning experiences.

Today's Literacy Connection

Students will interact with a nonfiction read aloud text, Flight of the Honey Bee, and demonstrate comprehension through a guided discussion.

Today's STEM connection

Students will identify and describe the structure and function of plant parts.
Students will practice essential science skills, such as observation and modeling.
Students will describe the interdependence of organisms in an ecosystem (specifically bees and flowers).

Materials Needed

Teacher Materials:

*Computer with projection and audio
*Chart paper and markers
*rules chart paper from Monday
*Flight of the Honey Bee by Raymond Huber picture book
*stapler

Students Materials:

*Paper lunch bags
*coffee filters
*cheetos
*paper towels
*markers
*colored pencils
*Science journals
*straws
*yarn cut into pieces approximately 2 inches long
*colored paper (green for leaves and other bright colors for petals)
*scissors
*scotch tape
*hole puncher
*pipe cleaners

*double sided sticky tape
*Q-tips
*yellow markers
*cut live flowers, such as lilies, tulips, daffodils
*pencils
*hand lens

Student Handouts:
*Student worksheet Cheetos Pollination

Day 5 Overview

Activities and Learning Goals

1. **Morning Meeting**

Students will build relationships to promote socio-emotional development.
Students will classify content specific vocabulary related to agriculture (fruits, vegetables, etc.).

2. **"Critter" Walk**

Students will explain how plants and animals interact in an ecosystem.

3. **Review Water cycle and transpiration experiments.**

Students will explain the water cycle using texts and a hands-on investigation.

7. **Time in the Garden/Virtual Garden**

Students will participate in real world gardening experiences, either in a container garden or virtual.

4. **Earthworm Extravaganza**

Students will describe the needs of an organism and how its habitat meets those needs.
Students will examine text structure to organize ideas in a sequential order.
Students will describe how organisms interact with their environment.

5. **Making a Salad**

Students will describe the life cycle of a plant from seed to harvesting fruit.
Students will examine USDA nutrition guidelines to classify foods (ex. Vegetable, fruit, etc.)

6. **Journal Reflection**

Students will write informative writing samples as they reflect on the day's learning experiences.

Today's Literacy Connection
Students will analyze text structure with a nonfiction read aloud text and demonstrate comprehension through a guided discussion. Additionally, students will examine a seed packet to practice following directions in a written text.

Today's STEM connection
Students will explore various science topics, such as animals and their habitats, food and nutrition, and the water cycle.

Materials Needed

Teacher Materials:
*Computer with projection and audio
*Chart paper and markers
*rules chart paper from yesterday
*journals and pencils
*chart paper/whiteboard and markers
*optional: small prize for game winner
*Diary of a Worm by Doreen Cronin picture book
*earthworms (can be purchased from the sporting goods store or in the sporting goods section of a large retailer)

Students Materials:
*Science journals and pencils
*hand lens
*paper towels
*student-collected natural materials from this morning's walk (rock, leaves, grass clippings, etc.)
*spray bottle with water
*shredded newspapers
*markers
*various vegetables & fruits for a salad (lettuce, carrots, cucumbers, apples, tomatoes, etc) - include as many vegetables from the community garden as possible
*seeds in the seed packet to correspond with the fruits and vegetables above
*Small plates
*forks

*Other salad ingredients as desired (dressing, etc.)

Student Handouts:
*Seed Packet Scavenger Hunt

Day 1

8:30-9:00: Morning Meeting: Teachers and students get to know each other better, while teachers set behavior expectations and go over the daily schedule

Materials:
*chart paper
*markers
*picture of a garden (can be local or a digital picture)

1. **Name game:** Each person introduces himself/herself and shares their favorite thing about nature.
2. **Establish ground rules:** Ask: what rules do we need in order for our time to be successful? Encourage students to create 3-5 rules which encourage safety and cooperation. Write them down on chart paper.
3. **Ag chat.** Show the garden picture. What do you already know about gardens? What do you notice about this picture? What do you wonder? Record student observations on chart paper.
4. **Schedule & Announcements:** Today we are going to make journals, go for a nature walk, spend time working in our garden, design a garden, and do a science experiment.

9:00-9:20: Making a Science Journal (Video Directions): Students will create and decorate a journal to record their learning adventure this week.

Materials needed:
*colored paper (at least 6 sheets per child)
*scissors
*colored pencils

1. Students neatly fold each paper in half “hamburger style” (on the wide side).
2. On one sheet, students trim the fold, but leave one inch intact on each side.
3. Keep all of the other sheets folded together and cut a one inch slit on each side of the fold.
4. Students gently roll the paper like a burrito long wise and slide it through the opening in the fold of the other paper.
5. Line the papers neatly and fold. The slits should align.

6. Students can write their name and decorate the front cover.

9:20-10:00: Nature Walk Scavenger Hunt: Students will participate in a nature walk and record observations and "wonder" questions about a natural item they collected.

Materials needed:
*copy of scavenger hunt for each student
*glue/glue sticks
*journal/pencils
*hand lens
*optional: devices for taking photos

Students glue the scavenger hunt list in their journal. After reviewing safety procedures (staying with the group, etc.), teachers lead the walk pausing to allow students to find the things on their scavenger hunt. Have students collect one small natural object that interests them. After the scavenger hunt, the teacher will model observing a natural object using the senses (sight, smell, feel). The group brainstorms descriptive words that might fit each of these senses (color, texture, smooth, rough, etc.). The teacher models writing 3-4 descriptive sentences. Next, students write their own descriptive sentences about their object of choice. Then, the teacher models using sentence starters to ask "wonder questions" about the object. Lastly, students use sentence starters to write their own "wonder questions.

Example sentence starters:
Where...?
What would happen if…
Why did…
What might...

Technology Integration Option: If available, have students use mobile devices (such as iPads) to take pictures of what they find on their scavenger hunt list.

10:00-10:30 - Time in the Garden. During this time, students will perform tasks in the garden as needed. Such tasks would include: planting seeds, weeding, harvesting, and turning compost. Teachers can model and give students guidance before starting. Additionally, marking work spaces for each child may help with management (as needed).

10:30-11:20: Create Your Own Garden (STEM Design Project): Students explore perimeter and area by designing a dream garden on graph paper.

Materials needed:
Book: Perimeter, Area, and Volume: A Monster Book of Dimensions by Edward Mill and David A. Adler
100 paper clips for each student
Centimeter graph paper
Colored pencils
pencils/erasers
Create Your Own Garden Worksheet

To begin, the teacher reads aloud the book Perimeter, Area, and Volume: A Monster Book of Dimensions. After students have a good understanding of dimensions, area, and perimeter, the teacher shows images of gardens (view different garden pictures here or here) and asks: *"What features of the garden most appear to you?" (use of rocks, shape of the garden, colorful plants, etc.) "How are dimensions used in a garden?" (include edging of the garden - perimeter, space to grow plants - area, amount of soil needed - volume). "This week we are going to design our dream gardens. First, we must design our space. Then we will design what type of plants we want to include in our space. Today, we will design our space by using Perimeter and area. In this challenge, your garden must have two sections. One for vegetables and one for flowers. You have 100 feet of material to edge the garden, so the total perimeter must be 100 feet or less. "

Give students 100 paper clips. Tell them each paper clip represents one foot of edging available for the gardens. Have them move the paperclips to define the shape of their gardens. Next, the teacher models how to transfer this design onto centimeter graph paper (1 paperclip = 1 cm side on the graph paper). After students draw the shape of their gardens onto the graph paper. They find the area of the garden by counting the squares inside each garden. They will record the perimeter and area of the garden on their worksheet. Have students share their designs with each other.

Optional math connection activities
Use if students need more support to understand dimensions/perimeter/area

Materials
*optional: flexible tape measures (one for each pair of students)

*optional: Meter stick or yard stick (one for each pair of students)

A. Exploring dimensions: Have students work in pairs to find something that is 3 ft wide, 1 cm long, etc. Students will use the ruler/tape measure.
B. Exploring perimeter: Use the tape measure to measure perimeter. Wrap it around an object (such as the perimeter of the desk). Model for students before having them try it in pairs.
C. Exploring area: Have students write their name in block letters on graph paper. Have them count the number of squares inside each letter to find the area.

11:20-11:40: Seed in a Glove Activity. Students explore germination by observing seed germination.

Materials needed:
*clear plastic glove (1 for each student)
*5 types of seeds: possible options include: lima beans, cucumber seeds, marigold seeds, pumpkin seeds, peas, zinnias)
*hand lens
*5 cotton balls per student
*spray bottle with water
*sharpie
*tape (scotch tape and masking tape both work)
*optional: A device for taking photos

Have students watch the time lapse video of a lima bean seed germinating and growing. Have students share observations. Explain to students we will see the process of germination take place through this experiment. Give students a couple of each of the 5 types of seeds. Allow time for students to observe each with the hand lens and discuss similarities and differences. Students spray each of the 5 cotton balls with water, so the cotton balls are saturated, but not dripping. Students place one cotton ball in each finger of the glove. Then they place one type of seed on top of the cotton ball in each finger. Tape the glove to help it retain moisture. Have students write their name and the date on the outside of the bag with a sharpie. The seeds need to be in the sunlight; one possible solution is to tape them in the window.

Technology integration: Students can take a picture of the glove each day and create a photo journal tracking the changes.

11:40-12:00: Journal Reflection: Students use sentence starters to reflect on what they learned today or a favorite activity. After writing, students can share with one another.

Possible sentence starters:
I used to think...but now I know…
One thing I found interesting…
I was really surprised when…
This reminds me of...
Today I learned more about...

Day 2

8:30-9:00: Morning Meeting: Teachers and students get to know each other better, while teachers set behavior expectations and go over the daily schedule

Materials:
*a way to play music (radio, computer with speakers, etc.)
*rules chart paper from yesterday
*Ag Q&A cards resource (cut prior to the meeting)

1. **Greeting: Freeze Greeting:** Play any music and stop it at random. When the music stops, students find the person closest to them and greet them. When the music starts playing, students continue to mingle around. Repeat a few times.
2. **Review ground rules:** Remind students of the established ground rules.
3. **Ag Card Match.** Pass out Q&A cards. Explain that some students have a question about US agriculture, while other students have an answer. Their job is to find the matching question with the answer. After students have matched up, go over questions and answers together to facilitate a discussion.
4. **Schedule & Announcements:** Today we are learning about soil, work in our community garden, and finish designing our gardens from yesterday

9:00-9:30 - Time in the garden. During this time, students will perform tasks in the garden as needed. Such tasks would include: planting seeds, weeding, harvesting, and turning compost. Teachers can model and give students guidance before starting. Additionally, marking work spaces for each child may help with management (as needed).

9:30-10:00: Soil Tour: Students will collect and observe small soil samples from the area

Materials:
*scotch tape
*journals/pencils
*hand lens

Guide students to 2-3 locations, preferable with different soil types (garden area versus play area, etc.). Have students observe the soil in each area carefully. Encourage them to take a pinch of soil between their fingers. Ask, “What does it look like?” “What does it

smell like?" What does it feel like? They can take a very small pinch and tape the sample into their journal and write 4-5 descriptive words for each soil sample.

10:00-10:45: Soil Science Activities: Students will be able to identify and describe the different types of soil through observation.

Materials:
*Types of Soil reading
*samples of sand, clay, and silt in paper cups
*hand lens
*paper plates
*tooth picks
*dropper/pipette
*small cup of water
*chart paper/marker
*science journal and pencils

Explain to students that today they will be learning about various types of soil. Have students read the Types of Soil passage with a partner using the "read, read, talk" protocol. (One partner reads, then the other reads, then they discuss what they read to check for understanding.) As a whole group, make a 3 X 3 chart. The teacher will draw it on the chart paper as students write in their journals. Label each row as 1, 2, and 3. Label the columns: 'Particle Size,' 'Feels,' and 'Dries.' (See example below.) Divide students into pairs or into small groups. Explain that groups will be observing the 3 soil samples for particle size, texture, and how it holds water. Demonstrate using the hand lens, model observing the particle size of a given sample. Explain the difference between clumps and particles, and model breaking a clump down into particles. Model rubbing a small amount of soil between your thumb and forefinger and describe what students might feel using vocabulary from the worksheet. Show how to drop one small drop of water into the soil sample and observe with the hand lens. Describe the changes to the soil and how quickly the water absorbs, runs off, or dries.

	Soil sample #1	Soil Sample #2	Soil sample #3
Particle Size			
Feels			
Dries			

Students will work in groups to observe the soil. Give each group a paper plate and have one of the students divide it into thirds and number each section. Give each group a cup with the first soil sample. Do not tell them what type of soil it is. Have students examine the sample with the hand lens and break up any clumps with the toothpick. Discuss students' observations and record them on the chart. Have students rub the soil between their fingers and record their observations on the chart.
Have students drop one drop of water onto the sample and observe it with the hand lens. Record their observations on the chart. Repeat this procedure with the other 2 samples.

Discuss the properties of soil as a whole group. “What did you discover about the particle size of soil sample 1?” “How did soil sample 2 feel?” etc. Compare the findings to the information read to determine the type of soil in each numbered cup. During their conversation, encourage students to build on each other's comments or link their comments. Provide some of the following sentence frames: "I agree with ____ because..." "I disagree with ____ because..." "What you said made me think about...."

10:45-11:20: Create Your Own Garden (STEM Design Project): Students will continue working with prior day’s garden design. On this day, they will shop for flowers and vegetables to plant in their garden and calculate a budget.

Materials:
*garden on graph paper from yesterday
*pencils
*colored pencils
*Student devices for accessing the internet
*Create Your Own Garden Worksheet
*optional: calculator

Have students look over their garden designs from yesterday. Ask, “How do you design your garden?” “What did you learn about perimeter and area?” “Today we are going to shop online for plants to put in your garden. In one garden, you will plant vegetables and fruits of your choice. In the other garden, you will plant flowers. Then, you will calculate the total cost of the plants in your garden.” Model for students how to select a plant and fill in the expense sheet. They will choose between 5-10 fruits and 5-10 vegetables. The teacher can adjust this number as it best fits the situation. Use teacher discretion on instructing students how to calculate the budget. If students are familiar

with adding decimals, they can compute the numbers manually. If not, they can round to the nearest dollar and estimate a sum or use a calculator. After completing the expense sheet, students can color their garden design, adding plants in the garden and decorating the area around the garden.

Technology Integration Option: Students can use a spreadsheet (such as Excel or Google Sheets). Students can create headings for the columns and learn how to use the autosum function. Teachers could also create the spreadsheet and share it with students to complete, depending on the student's need for support. The teacher assists as students shop for plants, fill in their budget sheet, and calculate their expenses.

11:20-11:40: Science Experiment: Carnation Colors: Students will add food coloring to water and place a cut white carnation in the water.

Materials:
*a cut white carnation for each group/pair of students
*vase or tall cup to hold water for each group/pair of students
*food coloring

Ask students what plants need to survive (water, sunlight, nutrients from soil, etc.). Then ask how plants get water (travels through the roots up the stem into the top of the plant). Model for students how to gently add 10-15 drops of food coloring to the water in the cup. Then place the flower in the cup. Ask students for predictions of what they think might happen and why. Continue to check on the experiment for the next 24-48 hours.

11:40-12:00: Journal reflection: Students use sentence starters to reflect on what they learned today or a favorite activity. After writing, students can share with one another.

Possible sentence starters:
I used to think...but now I know…
One thing I found interesting…
I was really surprised when…
This reminds me of…
Today we learned more about...

Day 3

8:30-9:00: Morning Meeting: Teachers and students get to know each other better, while teachers set behavior expectations and go over the daily schedule

Materials:
*rules chart paper from Monday
*whiteboard or chart paper with marker

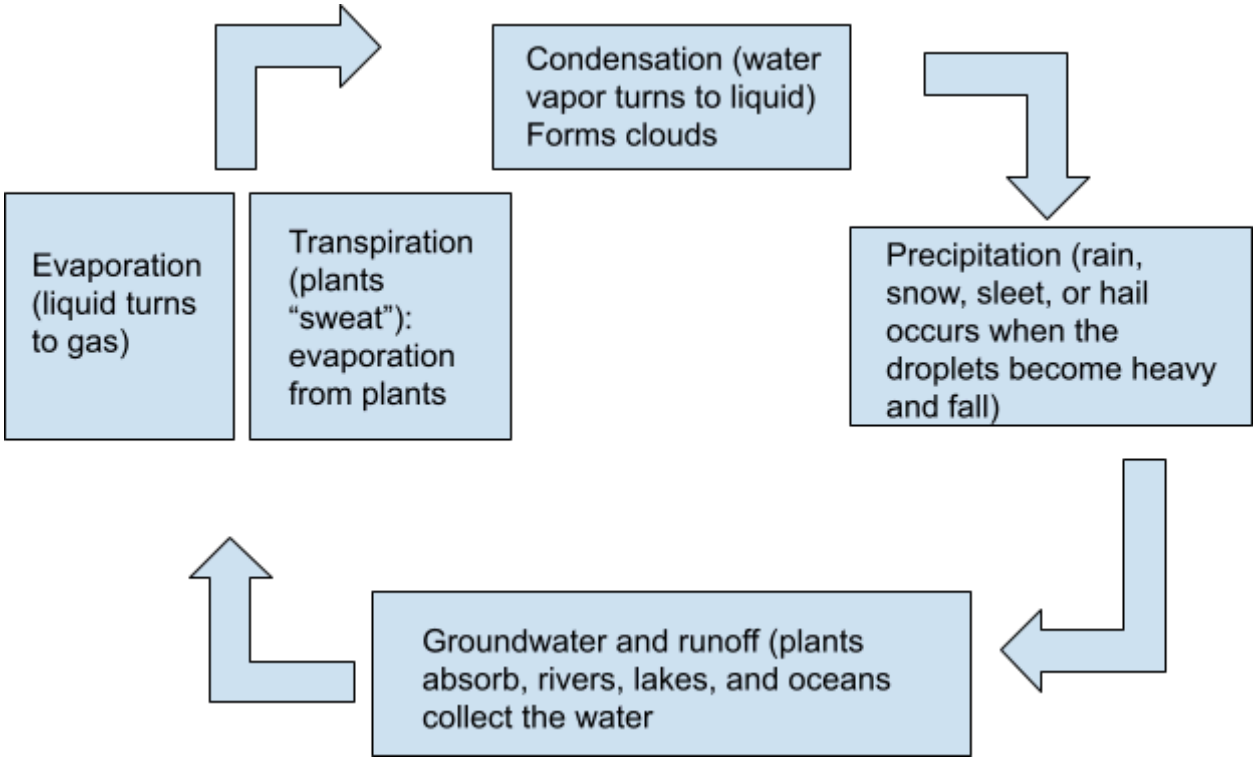
1. **Greeting: Choose your greeting:** The teacher chooses one student and asks how he/she would like to be greeted (high five, fist bump, or handshake). The teacher and the student greet one another; then the student chooses someone else and asks that person how they would like to be greeted. Continue until everyone has been greeted.
2. **Review Ground Rules:** Remind students of the established ground rules.
3. **Ag Pictionary:** The teacher chooses a word to draw based on the learning that has taken place so far this week. Then students guess the word. The person who correctly guesses the word gets to draw the next word. Relevant words include: seed, germination, soil, hand lens, journal, flower, perimeter, area, garden, etc.
4. **Schedule & Announcements:** Today we will spend time working in our garden, writing in our science journals, and doing water experiments.

9:00-10:00: Water Investigations: Students will learn about the water cycle through a read aloud and two experiments.

Materials:
*All the Water in the World in the World by George Ella Lyon (picture book)
*computer with speakers and projection
*Masking tape
*Gallon size plastic bags
*Small clear 6 oz plastic cups
*food coloring
*Sharpie
*journals and pencils

The teacher asks students what they already know about water. “Where does it come from?” After facilitating an introductory discussion, the teacher reads the picture book All

the Water in the World. Tell students, “Today we will explore the water cycle and the role plants play in the water cycle.” Have students watch The Water Cycle on the Study Jams website. Have students draw a copy of the water cycle into their journal. (see below)



Next, lead students on a “water hunt” walk outside. Have students look for evidence of the water cycle (clouds, a puddle, etc.). Then find a tree or bush. Place a gallon size plastic bag of the branch with several leaves. Seal the bag using tape as needed. Tell students you will check the bag again later today and tomorrow for evidence of transpiration. Depending on time, you may want to try this experiment on a tree, bush, and plant to compare results. Ask students to make predictions of what they think the bag will look like. What evidence of transpiration will they see?

When students are back inside, put students into pairs or small groups. Give students a clear plastic cup. Have them fill the cup halfway with water. Mark the water line of the side of the cup with a sharpie. Next add 1-2 drops of food coloring to the water. Have students place the cup inside a gallon size plastic bag. Seal the bag. Tape it to a window that receives plenty of sunlight. Watch over the next 24-48 hours for evidence of

the water cycle. Have students draw a picture in their journal of what they think the bag might look like. Write a sentence of two describing what might happen. Ask what they think may happen to the food coloring.

10:00-10:30 - Time in the Garden. The teacher can choose whether to have students calculate the figures manually or whether using a calculator would be appropriate to the specific learning goals and environment. After completing the expense sheet, students can color their garden design, adding plants in the garden and decorating the area around the garden.

10:30-11:40: Design Project: Irrigation System: Students will design and build an irrigation system for indoor house plants.

Materials: (for each group)
*biodegradable seed starter peat pots
*potting soil
*seeds of your choice
*plastic tubing with syringe (similar to this)
*clear plastic cups
*push pins
*small water bottles
*journals and pencils
*computer with speakers and projection

Explain to students the importance of irrigation in agriculture. Ask them if they have seen sprinklers in yards. You may want to share pictures of irrigation systems for homes or large farms. Show this drip irrigation video. Tell students that today they will design their own drip irrigation for indoor plants.

Assist students with planting seeds in three starter pots. Then have students experiment with moving water from the water bottle to the plastic cup by using the syringe and plastic tubing. Have students discover this with minimal support as this is an important step in the design process. Students will discuss with each other how to design the irrigation system and draw a blueprint of their design in their journals. Then they will write 2-3 sentences explaining how their design works. Afterwards, they can begin building their system. Ensure only adults use the pushpins for putting holes in the plastic tubing for safety.

11:40-12:00: Journal reflection: Students use sentence starters to reflect on what they learned today or a favorite activity. After writing, students can share with one another.

Possible sentence starters:
I used to think...but now I know…
One thing I found interesting…
I was really surprised when…
This reminds me of…
Today we learned more about...

Day 4

8:30-9:00: Morning Meeting: Teachers and students get to know each other better, while teachers set behavior expectations and go over the daily schedule

Materials:
*rules chart paper from Monday
*chart paper or whiteboard and markers

1. **Greeting: "That's me" Greeting:** Everyone stands in a circle. One person starts the game by saying something that is true about him/her (Example: I like to read. I am wearing blue., etc.) Others in the group who meet the qualification say "That's me" and step inside the circle and greet one another. Play several rounds.
2. **Review ground rules:** Remind students of the established ground rules.
3. **AG game:** Play hangman with students to review words from this week's learning goals (examples: water cycle, transpiration, condensation, cloud, water vapor, evaporation, seed, germinate, etc.)
4. **Schedule & Announcements:** Today we will explore the parts of plants and how animals are important to agriculture through outside activities and indoor experiments.

9:00-9:30 Leaf Identification Activity: Students will observe a leaf carefully and be able to identify their leaf among other leaves based on their careful observations.

Materials:
*hand lens
*colored pencils
*Science journals

The teacher facilitates a nature walk and instructs students to collect a leaf that interests him/her. (This is also a good time to check on yesterday's transpiration experiment.) Students will use a hand lens to closely observe the leaf. He/she will draw the leaf in detail in his/her journal. Next, the teacher will collect the leaves and mix them with the rest of the group. Then, students will use their drawing to find their leaf based on their drawing. Lastly, the teacher collects the leaves and mixes them again. students switch journals with a partner. Then, students use their peer's journal to identify the correct leaf

and confirm it with the original artist. Discuss what characteristics and details made it easier to identify the leaf. Discuss why careful observation is important.

9:30-10:00: Time in the Garden During this time, students will perform tasks in the garden as needed. Such tasks would include: planting seeds, weeding, harvesting, and turning compost. Teachers can model and give students guidance before starting. Additionally, marking work spaces for each child may help with management (as needed).

10:00-10:30 Model of Flower: Students learn about the parts of a flower by making a model from everyday materials.

Materials:
*straws
*yarn cut into pieces approximately 2 inches long
*colored paper (green for leaves and other bright colors for petals)
*pencils
*scissors
*scotch tape
*hole puncher
*pipe cleaner
*double sided sticky tape
*Q-tips
*yellow markers
*Computer with projection
*journals and pencils

Explain to students the parts of a flower by reading aloud and discussing the diagrams on the Flowering Plants Ducksters website. Then, guide students through the steps to make a model of a flower.

Have students trace their hands-on colored paper three times and cut it out. Then students draw and cut leaves from the green paper. students cut 3-4 pieces of strings about 2 inches in length and tape them to the bottom of the straw. They will represent the roots. students can then use tape to attach the leaves to the straw, which will represent the stem. Students can use a hole puncher to punch holes in the bottom palm section. of the hand print “petals.” They can slide it onto the straw and be secured with tape. students slide a pipe cleaner inside the straw with it protruding out the top about

two inches to represent the pistil - secure with tape if needed. Students can place double sided sticky tape around the top to show how the top of the pistil, the stigma, is sticky to hold onto pollen. Next, students color one cotton end of a Q-tips yellow to represent pollen. Then, they tape three Q-tips around the top of the straw surrounding the pipe cleaner. Have students sketch their model in their journal and label the following parts: stem, leaf, petal, roots, pistil, stamen. It may be helpful to continue projecting the website while students label their drawing.

10:30-11:00: Dissecting a Flower: Students dissect flowers in order to see the parts of the plants modeled in the previous activity.

Materials:
*Cut flowers, such as lilies, tulips, daffodils
*science journals
*pencil
*scotch tape

Students are given a flower to dissect. While many types of flowers might work and students could choose a flower from outside, some plants are easier to dissect than others. It is recommended to use lillies, tulips, or daffodils. Have students sketch the flower in their journal and make observations with their hand lens. Discuss that the roots are missing. Have students gently separate the leaves and stem. They tape them into their journal and label them. Then, gently remove the petals. Students should be able to see the pistil and stamen. Have them observe them closely with the hand lens. They can tape and label these parts to their journal also. Students can view this (video) for a similar flower dissection activity.

11:00-11:40: Flowers and Bees: Students will describe how bees and flowers interact through a read aloud and modeling activity.

Materials:
*Flight of the Honey Bee by Raymond Huber picture book
*Paper lunch bags
*stapler
*coffee filters
*cheetos
*paper towels
*markers

*Student worksheet Cheetos Pollination

The teacher will read aloud the picture book Flight of the Honey Bee stopping to ask questions to ensure student comprehension. Then explain to students how they will model how bees interact with flowers.

1. Have students color the coffee filter with markers. Then, staple the coffee filter to the top of an open lunch bag (see picture).
2. Pour a serving of Cheetos in the brown paper bag. Tell students they can eat their Cheetos, but they cannot wipe off their hands or lick their fingers.
3. After students have eaten, have them rotate to other groups and touch their fingers (covered in cheese powder) to the “flower” (coffee filter) of other students.
4. Discuss with students how the fingers model the pollen from flowers attached to the little hairs on the body of bees. When the bee flies to another flower to get nectar (bee food), it spreads pollen to the flowers, which helps the flowers reproduce. This models the interdependence of the flowers and bees. Flowers need the bees to spread the pollen, while bees need the flowers to provide nectar for food.
5. Have students complete the student worksheet

11:40-12:00: Journal Reflection: Students use sentence starters to reflect on what they learned today or a favorite activity. After writing, students can share with one another.

Possible sentence starters:
I used to think...but now I know…
One thing I found interesting…
I was really surprised when…
This reminds me of…
Today we learned more about...

Day 5

8:30-9:00: Morning Meeting: Teachers and students get to know each other better, while teachers set behavior expectations and go over the daily schedule

Materials:
*rules chart paper from yesterday
*journals and pencils
*chart paper/whiteboard and markers
*optional: small prize for game winner

1. **Greeting:** The teacher greets a student and asks them to share their favorite part of the week. The student shares and greets a peer. Continue until everyone has been greeted.
2. **Review ground rules:** Remind students of the established ground rules.
3. **How many in a minute game**: The teacher will name a category (types of flowers, types of vegetables, types of fruits, etc.), and students will list as many as they can think of in their journal. Let students know this is a brainstorming activity, and it is ok if not everything is spelled correctly. Have students share out to create a master list. You may choose to give a small prize to students who are able to name the most for a category.
4. **Schedule & Announcements:** Today we will explore how animals are important to gardening through outside activities and indoor experiments.

9:00-9:20: "Critter" Walk

Materials:
*Science journals and pencils
*hand lens

Have students visit the garden and/or a natural area and ask them to observe evidence of animal life. Facilitate discussion by asking questions like:
*What kind of animals do you observe in the garden?
*Why do you think they are there? Mammals, insects, etc.
*Do they help or hurt the plants?
*What do they gain from the plants?
*What evidence do you observe that animals have been there previously (leaves with holes in them, foot prints in soil, etc.)

Help students make connections to the prior day's lesson on pollinators. Let them know today they will continue studying animals by learning about earthworms. Have students record observations in their journals.

9:20-9:40: Review Water Cycle and Transpiration Experiments.

While outside, visit the transpiration experiment. Facilitate a discussion on what is occurring. Ensure students understand the water droplets in the bag came from water vapor being released in the leaves of the plant. The vapor cooled and condensed onto the sides of the bag. Before heading inside, ask students to collect a few natural materials for an activity later today. These items may include small rocks, leaves, grass clippings, etc.

Secondly, look at water cycle experiments. Facilitate a discussion to further student understanding of the water cycle. Where is the evidence of each of the steps of the water cycle (evaporation, condensation, precipitation)? What happened to the food coloring? How might this be similar to the salt in the ocean?

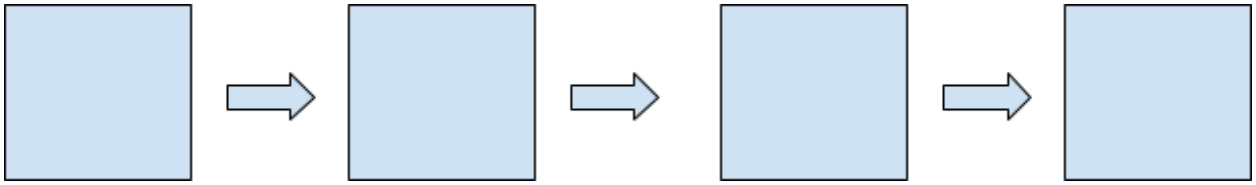
9:40-10:10: Time in the Garden. During this time, students will perform tasks in the garden as needed. Such tasks would include: planting seeds, weeding, harvesting, and turning compost. Teachers can model and give students guidance before starting. Additionally, marking work spaces for each child may help with management (as needed).

10:10-11:10: Earthworm Extravaganza: Students will listen as the teacher reads aloud Diary of a Worm. Then, students will create an earthworm habitat based on what they learn about what the worms needs.

Materials:
*Diary of a Worm by Doreen Cronin picture book
*earthworms (can be purchased from a sporting goods store or the sporting goods section of large retailer)
*paper towels
*student collected natural materials from the morning walk (rock, leaves, grass clippings, etc.)
*spray bottle with water
*shredded newspapers
*marker

*chart paper/markers

The teacher reads Diary of an Earthworm to students. After reading, the teacher discusses the sequence text structure. As a whole group, everyone creates a graphic organizer of major events in the story. (see below).



Next the teacher explains that students will be creating an “earthworm playground” to learn more about what type of habitat earthworms need. Note: It is important for students to understand the importance of treating the worms with gentleness. Students are given a paper towel. With a marker, divide the paper towel into two sections and label them moist and dry. Students gently spray the section of the paper towel labeled moist with the spray bottle. Emphasize the surface does not need to be dripping wet. Model as needed. Then give students materials (leaves, shredded newspapers, other natural materials) to build a “playground” for the earthworm. Students then place an earthworm into the “playground” to observe the preferred environment for the earthworm. Connect the observations to the book as the earthworm will prefer a cool, dark, damp side. Afterwards, the earthworm is released into the garden. Be sure to emphasize how the earthworms will help to aerate the soil in the garden and turn dead leaves into nutrients for plants.

11:10-11:40: Making a Salad: Students will learn about the plant cycle from seeds to harvesting.

Materials:
*various vegetables & fruits for a salad (lettuce, carrots, cucumbers, apples, tomatoes, etc) - include as many vegetables from the community garden as possible
*seeds in the seed packet to correspond with the fruits and vegetables above
*Small plates
*hand lens
*forks
*other salad ingredients as desired (dressing, etc.)
*computer with projection
*Seed Scavenger Hunt Handout

As a whole group, discuss ingredients that go into a salad. Discuss lettuce, carrots, cucumbers, tomatoes, cheese, salad dressing, possibly fruits, such as strawberries or apples. Ask students to classify these ingredients according to the myplate.gov diagram.

Show students lettuce, tomatoes, carrots, apples, and cucumbers. Then show students the seeds. Allow time for students to examine the seeds and predict which seed matches which vegetable/fruit. Then have students examine the seed packets. Which ones take the longest to germinate? Which ones take the longest to harvest? If you wanted to eat this salad today, when would you need to plant each ingredient?

Guide students into completing the Seed Packet Scavenger Hunt. Depending on time, you may choose to follow the lesson as scripted or simply complete page 5.

After completing the seed scavenger hunt, have students build their own salad and enjoy!

11:40-12:00: Journal Reflection: Students use sentence starters to reflect on what they learned today or a favorite activity. After writing, students can share with one another.

Possible sentence starters:
I used to think...but now I know…
One thing I found interesting…
I was really surprised when…
This reminds me of…
Today we learned more about...

Enrichment suggestions:

*Students can create computer generated 3-D designs of their garden, using such programs as Tinkercad and, if available, print them with a 3D printer.

*In the garden design challenge, students can investigate volume by calculating how much soil is needed to fill the garden

*Students can visit a local berry picking farm. Additionally, some nonprofits work with farmers by inviting people to glean from the field and donate the harvest to a local food bank.

*Students can skype with a local farmer or take a virtual field trip.

*This soil erosion experiment from Life is a Garden is a great way to show the importance of vegetation to prevent erosion.

*Have students create seed bombs in order to provide food for pollinators, such as honey bees.

*Have students create "Grass heads" as explained with Red Ted Art.

*Dig deeper with the earthworm investigations to learn about composting. This compost in a bottle experiment is a great way for students to see the process occur over time.

Create Your Own Garden
Day 1

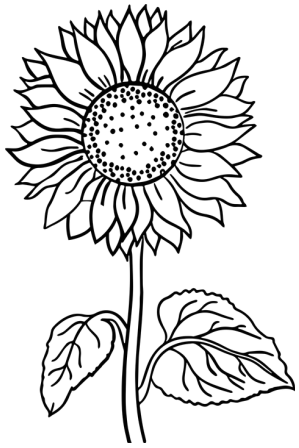
1. Complete the table

	Garden 1	Garden 2
Perimeter		
Area		

2. Explain how you found the perimeter of each garden.

3. Explain how you found the area of each garden.

4. What other things did you learn about perimeter and area today?



Create Your Own Garden
Day 2

Complete the tables to show which plants you chose to purchase for your garden. Then, calculate the total cost.

Vegetables/fruits	**Cost**	**Quantity (How many?)**	**Total cost**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
Total Cost			

Flowers	**Cost**	**Quantity (How many?)**	**Total cost**
1.			
2.			
3.			
4.			
5.			
6.			

7.			
8.			
Total Cost			

Morning Meeting
Matching Game Cards
Day 2

Print and cut. There are 8 questions and 8 answers. If you have more than 16 participants, print extras. Facts taken from: https://www.fb.org/newsroom/fast-facts

What are the top 3 US farm products?	(cows, corn, soybeans)	Which state is the #1 producer of sweet potatoes in the country?	North Carolina
How many farms are in the US?	2.1 million	Which stated is the #1 producer of milk in the United States?	California
How many people can the average US farmer feed?	166	Which state is the #1 producer of potatoes?	Idaho
How much of the food Americans bring home each month do they typically throw away?	1/4	What percent of American farmers are female?	36

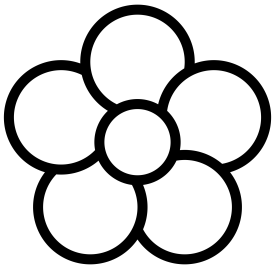
Student Worksheet Cheetos Pollination

Focus Question: How do bees and flowers help each other?

What I already know about bees and flowers:

What happened when you touched the coffee filter on someone else's flower?

What does each piece of our experiment model in real life?



Flower: _____

Fingers: _____

Cheese puffs: _____

Why do bees need flowers?

Why do flowers need bees?