Module 4- Summer Garden Module

 **Driving Question(s)**

Driving Questions: How can we produce crops outside all year long?

Examples of Sub-Driving Questions:

* How can we determine what we will grow this summer?
* What have we learned so far this year that will help with our summer gardening?
* What would we need to teach others in order for them to be able to take care of our garden over the summer?

 **Overview**

Students conduct research to find the best cucurbit to grow in the summer. The students will use the knowledge they have gained this year along with addition research about cucurbits to make a plan for the summer garden. Then the students will prepare the summer garden and plant the seeds after the last frost. The students will also work on an instructional video and care-takers guide for families to help care for our plants during the summer.

It is best to start this module in April. It will take about a month to get everything ready for the summer garden. Plants should not be planted outside until after the last frost.

 **Major Products & Performances**

Lesson 1: Research on cucurbits

Lesson 2: Garden Map

Lesson 3: Preparing a Caretakers Guide

Lesson 4: Letter to Parents

Lesson 5: Movie/Presentation to parents

Other: Outdoor cucurbit garden and produce that can be sold at a Farmer’s Market

**Teacher Background**

About the Plant:

Information will vary depending on what your students select to grow. Here are some resources for the different cucurbits:

Cucumbers: See Module 3

Gourds: <http://www.ces/ncsu.edu/hil/hil-29.html>

Luffa: <http://www.extension.umn.edu/garden/yard-garden/vegetables/growing-luffa-gourds/>

Melons: <http://aggie-horticuluture/tamu/edu/vegetable/files/2010/10/E-282_melons.pdf>

Pumpkins: <http://www.ces.ncsu/edu/hil/hil-24.html>

Squash: <http://aggie-horticulture/tamu/edu/vegetable/files/2010/10/E-286_squash.pdf>

Watermelon: <http://uaex/edu/publications/pdf/fsa-6012.pdf> and <http://www.hfrr.ksu.edu/doc1820.ashx>

All cucurbits produce fruits. It would be a good idea to discuss the difference between fruits and vegetables.

Growing Tips:

Cucurbits have many pests including the cucumber beetle, squash bug and squash vine borer. It is important to learn about these pests and how to care for them.

Cucurbit diseases: <http://www.clemson.edu/extension/hgic/pests/plant_pests/veg_fruit/hgic2206.html>

Bad Bugs: <http://www.clemson.edu/extension/hgic/pests/plants/plant_pests/veg_fruit/hgic2207.html>

Cucurbits are sensitive to the frost and therefore need to be covered by a low-tunnel if planted before the last frost. If you are not using a low-tunnel then you need to make sure you plant after the last frost.

Setting up the Garden Bed:

Before planting make sure that the soil is moist but not wet.

For more information on starting a garden visit: <http://anr.ext.wvu.edu/lawn_garden/start_a_garden>

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| Title | Lesson 1: Researching Cucurbits  |
| Overview | Students will use what they learned while growing cucumbers in the classroom to research the cucurbit family. Then the students will select a type of vegetable in that family that they would want to grow in the garden. The students will create a short 5 minute presentation to convince their classmates that we should grow that fruit/veggie over the summer. Duration: 1 week |
| Standards | Science and Engineering Practices: Engaging in argument from evidence; Obtaining, evaluating and communicating informationReading/Language Arts:ELA.4.R.C.1.6: explain events, procedures, ideas or concepts in a historical, scientific or technical text, including what happened and why, based on specific information in the informational text. ELA.4.R.C3.3: interpret information presented visually, orally, or quantitatively and explain how the information contributes to an understanding of the informational text in which it appears. ELA.4.R.C3.5: integrate information from two informational texts on the same topic in order to write or speak about the subject knowledgeably. Writing: ELA.4.W.C9.1: Write opinion pieces on topics or texts supporting a point of view with reasons and information. ELA.4.W.C9.2: write informative/explanatory text to examine a topic and convey ideas and information clearly. ELA.4.W.C11.1: Conduct short research projects that build knowledge through investigation of different aspects of a topic. ELA.4.W.C.11.2: recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.ELA.4.W.C12.1: write routinely over extended time frames and shorter time frames for a range of discipline-specific tasks, purposes, and audiences.Speaking and Listening:ELA.4.SL.C13.1: engage effectively in a range of collaborative discussions with diverse partners on grade 4 topics and texts, building on others’ ideas and expressing their own clearly. ELA.4.SL.C14.2: add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.  |
| Materials/Advance Preparation Needed | Materials: * Computers
* Books about gardening different plants

Advanced Preparation: Read the background information on cucurbits.  |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | Ask students to think about what they have learned in gardening this year. Review the different plants they have grown and harvested. Ask students to think about what was similar between the plants and how they were different. Call particular attention of the cucumbers the students just finished growing and remind students that they are part of the cucurbit family. Then explain to students that they will be growing a plant from the cucurbit family over the summer. What we grow is up to them.Explain to students that they will get into small groups and select a cucurbit (squash, pumpkins, zucchini, gourds, watermelon, cucumber, and melons are some examples) they would want to grow in the summer garden. The students will research the cucurbit and create a PowerPoint with 4-5 slides. Their goal is to convince their classmates that this is the crop they should plant in the garden. Have the students come up with the criteria for the PowerPoint; including what information they would want about the different plants. Then allow time to work on their research. Next have students present their PowerPoint to the classmates convincing them that we should select their cucurbit for the summer garden. After the students watch the different presentations have them vote on the plant they want to grow. Follow the procedure from Lesson 2 of Module 1 to prepare the summer garden.  |
| Assessment (What will be the evidence of student learning?) | Students will be assessed on the completion of their PowerPoint presentation and then presenting it to their classmates.  |

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| Title | Lesson 2: Setting up Summer Garden  |
| Overview | The students will use the information from their research and their knowledge of gardening to prepare the summer garden. Duration: 2 or 3 days |
| Standards | Science and Engineering Practices: using mathematics and computational thinking; obtaining, evaluating, and communicating informationMath:M.4.MD.1: know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec, within a single system of measurement, express measurements in a larger unit in terms of a smaller unit, record measurement equivalents in a two column table, (For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in.) and generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36)M.4.MD.2: use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects and money, including problems involving simple fractions or decimals and problems that require expressing measurements given in a larger unit in terms of a smaller unit and represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.M.4.MD.3: apply the area and perimeter formulas for rectangles in real world and mathematical problems. |
| Materials/Advance Preparation Needed | Materials: * Raised bed or EarthBox outside,
* seeds of the cucurbits that the class selected,
* research notes and seed pack information for growing the plants
* Graph paper or Science Notebook

Advanced Preparation: Prepare the garden for summer growing- you can have students help with this by clearing out the bed and mixing up the soil.  |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | Take the students outside to measure the garden bed. The students will use what they learned about preparing the garden bed from module 1. Have students refer to their notes and the information on the seed packet to decide how they will space the plants into the garden to make sure they have room to grow. Remind the students that they may want to plant a few extra plants to sure that we have a healthy crop; we can thin the crops once they start to grow. Return to the classroom and have students work together to plan how the garden will look. Together they will draw their plan in their science notebook that we can use to plant our garden outside. \* Students can raise seedlings in the classroom to jump start their summer garden. They can also use their low-tunnel to help plant their crops earlier. If you do not use a low-tunnel then make sure that you are planting after the last frost. Take the students outside and have them plant the garden based on their plan. Return to the garden every couple days to water and tend to the garden as needed.  |
| Assessment (What will be the evidence of student learning?) | Students will be assessed on their completion of the garden map. Students will include measurements and placement of plants on the map. |

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| Title | Lesson 3: Caretakers Guide  |
| Overview | The students will work together to create a caretakers guide that can be used by their families to help take care of the garden during the summer months. This guide will provide information about our plants and instructions on how to care for the plants. Duration: 1 week  |
| Standards | Science and Engineering Practices: Obtaining, evaluating and communicating informationReading/Language Arts:ELA.4.R.C.1.5: determine the main idea of an informational text and explain how it is supported by key details; summarize the text. ELA.4.R.C.1.6: explain events, procedures, ideas or concepts in a historical, scientific or technical text, including what happened and why, based on specific information in the informational text. ELA.4.R.C3.3: interpret information presented visually, orally, or quantitatively and explain how the information contributes to an understanding of the informational text in which it appears. ELA.4.R.C3.5: integrate information from two informational texts on the same topic in order to write or speak about the subject knowledgeably. Writing: ELA.4.W.C9.2: write informative/explanatory text to examine a topic and convey ideas and information clearly. ELA.4.W.C11.1: Conduct short research projects that build knowledge through investigation of different aspects of a topic. ELA.4.W.C.11.2: recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.ELA.4.W.C12.1: write routinely over extended time frames and shorter time frames for a range of discipline-specific tasks, purposes, and audiences. 21st Century Skills: 21C.O.3-4.1.LS.1Student identifies information needed to solve a problem or complete an assignment, conducts a search and prioritizes various sources based on credibility and relevance, retrieves relevant information from a variety of media sources, and uses this information to create an effective presentation. 21st Century Skills: 21C.O.3-4.1.LS.3Student articulates thoughts and ideas accurately and effectively through oral, written or multimedia communications. 21st Century Skills : 21C.O.3-4.3.LS.4Student appreciates, accepts, and works cooperatively with others, in both academic and social contexts, shares responsibility for continued improvement of the academic performance and climate of the school, and exhibits ethical behavior while working alone or communicating with others. 21st Century Skills: 21C.O.3-4.3.LS.6Student focuses on the larger goal of a project, frames appropriate questions related to the goal, develops and initiates a plant of action with specific tasks and appropriate benchmarks, and completes the project on time. |
| Standards |  21st Century Skills:21C.O.3-4.1.TT.3Student uses menu options in software applications to create documents, simple spreadsheets and presentations and to save files to various locations. Student begins to use e-mail to exchange documents with other teachers and students. Students know how to organize files through the use of folders. 21st Century Skills : 21C.O.3-4.1.TT.4Student finds, imports, inserts, and resizes or moves pictures, images and charts in word processing documents, spreadsheets, presentations and other electronic templates. 21st Century Skills: 21C.O.3-4.1.TT.5Student uses word processing software to create and format a document, use Edit menu to cut, copy, paste and change font type, size and color, select and highlight text, and other common editing features. 21st Century Skills: 21C.O.3-4.1.TT.10Student selects and uses appropriate software, other technologies, and grade level appropriate search engines to locate and acquire information from electronic resources. Student evaluates information found for content and usefulness. 21st Century Skills: 21C.O.3-4.2.TT.3Student uses technology tools for individual and collaborative writing, communication, and publishes activities to create informative products for audiences inside and outside the classroom. |
| Materials/Advance Preparation Needed | Materials: * chart paper,
* markers,
* computer and book for research,
* binder

Advanced preparation: Create a list of things you (the teacher) thinks should be in the caretakers guide. Find some good resources to help with the students research (good books or websites to guide the students too).  |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | Explain to the students that they will be creating a guide for how to take care of the garden. Ask the students to think about what should be included in that guide. Then have students share their ideas and make a master list on chart paper (I would put the list on something that can be displayed throughout the whole research process). Some ideas of what to include in the caretakers guide: major pests and how to get rid of them; how and when to water the plants; when are the crops ready to be harvested; brief overview of the students project; background information about the type of plant being grown; information on pollination; etc.After students have agreed on a list of information for the guide, spend some time talking about the expectations of what the caretakers guide will look like. Ask students how they think the information should be presented (bullets, paragraphs, pictures). Discuss how the information should be organized (table of contents, what order the information might go in). Then explain to students that they will work with a partner to research one of the topics from our brainstorm sheet. The pair will create a word document to be placed into our caretakers guide. Allow students time to complete their research and create their document. Make sure to review students writing, check for facts, and remind students to include their sources. As students finish they can work on putting their pages into the caretakers guide. Students can also help create a table of contents when all the pages are finished and in order.  |
| Assessment (What will be the evidence of student learning?) | Students completed caretakers’ page to create a classroom caretakers’ guide.  |

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| Title | Lesson 4: Persuasive Letter |
| Overview | Students will write a persuasive letter to their families convincing them to help with the garden over the summer. Duration: 1 day |
| Standards | Reading/Writing:ELA.4.W.C9.1: Write opinion pieces on topics or texts supporting a point of view with reasons and information.ELA.4.W.C12.1: write routinely over extended time frames and shorter time frames for a range of discipline-specific tasks, purposes, and audiences. |
| Materials/Advance Preparation Needed | Materials: * paper
* pencils

Advanced preparation: students have already been introduced to persuasive writing and letter writing |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | After students have finished working on the caretakers guide and presentation but before they have presented for their parents, have them write a persuasive letter to their family convincing them to help care for the garden over the summer. Review with students the correct format of a letter and brainstorm reasons that they could include in their letter (family fun, families can keep the summer harvest, etc.). Once students have finished their letter have them peer edit and revise. The teacher might also want to meet with students to review the letter. These letters can be sent home or given out during the presentation night.  |
| Assessment (What will be the evidence of student learning?) | Students will be assessed by their completed letters to persuade their parents to help with the garden.  |

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| Title | Lesson 5: Video and Family Presentation  |
| Overview | The students will create a video explaining their summer garden and how to care for it. Then they will present this to their families and ask families to sign up to help care for the garden in the summer. Duration: 1 week (students can be working on this at the same time as the caretakers guide) |
| Standards | Reading/Speaking Listening:ELA.4.SL.C13.1: engage effectively in a range of collaborative discussions with diverse partners on grade 4 topics and texts, building on others’ ideas and expressing their own clearly.ELA.4.SL.C14.2: add audio recordings and visual displays to presentations when appropriate to enhance the development of main ideas or themes.21st Century Skills: 21C.O.3-4.1.LS.3Student articulates thoughts and ideas accurately and effectively through oral, written or multimedia communications.21st Century Skills : 21C.O.3-4.3.LS.4Student appreciates, accepts, and works cooperatively with others, in both academic and social contexts, shares responsibility for continued improvement of the academic performance and climate of the school, and exhibits ethical behavior while working alone or communicating with others.21st Century Skills: 21C.O.3-4.2.TT.3Student uses technology tools for individual and collaborative writing, communication, and publishes activities to create informative products for audiences inside and outside the classroom. |
| Materials/Advance Preparation Needed | Materials: * Computers,
* Video Cameras (and camera/phone that can record video),
* computer program to combine video clips into a full video OR videos can be placed into a PowerPoint presentation

Advanced Preparation: Students should already complete their caretakers’ guide which will help them with the information they need for this video. Select a day and time to present to the parents and make sure that families are invited.  |
| Procedures/Steps:(Emphasis on students making inquiry, e.g., posing questions/problems and working towards answers and solutions)  | Explain to students that they are going to make a presentation for the families. The presentation if going to be in the format of a movie (or you could have the students perform live if you don’t want to mess with a movie). Have students look at their list of things we needed for the caretakers guide and decided which of those should also be in the video. Then have the students brainstorm any additional information they would want in the video (like a trip to the garden bed and background of their gardening experience). Next, allow the students to select the topic they will report on. Students will practice their presentation and then record their video clip. Once all clips have been collected they can be assembled into a class video. This video will be shown to the parents at the class presentation. If it also helpful to have a calendar for the summer and ask families to sign up for a week that they would be able to help with the garden. Collect families names, email and phone numbers so that you can send a friendly reminder over the summer months.  |
| Assessment (What will be the evidence of student learning?) | Video clip  |