



Module 3: Developing a Locally-Based Food System

Using the Harvest

Objectives

Students will be able to:

- follow a recipe;
- make their own simple recipe;
- determine average garden production
- list options for the use of extra garden produce

Oregon Content

Standards:

- 1.3S.3 Describe why recording accurate observations is important in science.
- 3.0A.A Represent and solve problems involving multiplication and division.
- 3.0A.D Solve problems involving the four operations, and identify and explain patterns in arithmetic.
- 3.NF.F Develop understanding of fractions as numbers.
- 3.MD.2 Measure and estimate liquid volumes and masses of objects using standard units
- 4.DM.1 Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
- 4.2P.1 Describe physical changes in matter and explain how they occur.
- 6.1P.1 Describe physical and chemical properties of matter and how they can be measured.
- ET.2.A Interact and collaborate with peers, experts, or others employing a variety of digital environments and media.
- ET.2.B Effectively communicate and publish to multiple audiences using a variety of media and formats.

Background

There are so many things that can be done with the produce grown in school gardens. It can be used during garden education with the kids who are doing the growing. It can be sent home with students to be used by families. Some schools have started their own produce stands where they sell produce to provide funding for their garden. Others have grown the produce to use in the school cafeteria or to give to homeless shelters.

One of students' favorite activities is to use the garden harvest to cook with. They love to be able to wash, chop, measure, stir and then eat what they've grown. Eating is the ultimate garden reward. Though cooking with kids can seem daunting at first, using these simple rules will alleviate a lot of stress and keep kids safe.

- Do cooking tasks one at a time so it's easier to keep track of what all the students are doing. Separate activities into distinct time frames- harvest, wash (hands and produce), chop/grate/tear, cook then eat. Breaking students up into small groups with an adult is ideal.
- Wash hands with soap and hot water. If you touch your hair or rub your eyes, etc. you need to wash your hands again. Make sure that kids are just as aware of this as you are. Roll up sleeves and put hair back.
- Wash any produce that you're going to use, remove bad spots.
- Students who are cutting and cooking with a burner need to be separate from the rest of the group in a quiet and calm space so they can focus on their task.
- Go over knife safety with students. Show them the handle of the knife and the blade. Be clear that they can cut themselves if they aren't careful. They should never touch the blade of the knife, just the handle. If the blade gets near to their fingers- they stop no matter what. Show them how to use the knife and cut. Encourage them to work slowly and carefully and take knives away from any student who doesn't follow these directions.

Garden Tasks

- Harvest from the garden
- Taste things in the garden
- Cook with things in the garden

Tasting Etiquette

It's very important to talk about how to taste with kids. Gross faces or kids spitting things out makes other students less likely to try new things. Let students know that everyone's sense of taste is different and that each student should have the chance to make their own decision about taste.

- Try a tiny amount to start- if you like it you can have more, if you don't it's small enough that you can swallow it.
- Keep negative comments and faces to yourself.
- Spitting things out is unacceptable, that's why you should only take a little to start.
- Instead of saying they like or dislike like it, encourage students to describe the taste.

- When cooking with a burner, students need to be aware of a few things. Show them how the burner works, remind them that anything on or left near the burner is going to get hot enough to hurt them. Show them how to move the pan/pot with hot pads and how to stir without touching the hot pan. Students should keep away from the burner unless it is their turn to stir. Anyone not being careful will not get to help with the cooking.

Cooking Rules adapted from **Willamette Farm and Food Coalition's Farm to School Program Food Safety Protocol** and *Knife Safety Sheets*. The full documents are attached at the end of this lesson with more information on transporting and storing produce.

Project

Make A Recipe

Length- three or four 30 min-1 hour sessions

Materials- recipe books, paper, pencils, knives, cutting boards, measuring utensils, dishes, burner, pan, pots, various ingredients as needed: olive oil, vinegar, flour, sugar, baking power, etc.

Preparation- gather materials, buy extra ingredients, review cooking safety

1) Have students brainstorm the best way to make a recipe. You could have a chief or cook come talk with the students about this and give them some tips. Encourage them to focus on what materials they have. Go out to the garden and see what's there, show them what other materials they can use. You can choose to limit their options depending on age and resources. Here are some dish ideas from most to least simple/easy:

- salad
- stir fry/sauté
- produce (zucchini, pumpkin, berry, etc.) pancakes
- preserves

2) In small groups, students will first pick one or two things in the garden that they want to be the basis for their dish. They can research recipes that involve those ingredients to get ideas and then decide what sort of dish they are going to make.

3) Before students actually start designing their recipe, do the PB&J (or a variation if nut allergies are present) Sandwich activity. Each group will write out instructions for making a PB&J. Have an adult read and follow the directions to the letter, being as silly as possible whenever things are unclear. Use this to

illustrate the importance of clear directions in the recipes they will be making. This is a great time to introduce students to various measurements, measuring devices and the practical use of fractions.

3) Next students will design their recipe. Go over cooking safety rules with the students and make sure that as they are using cooking gear, there is plenty of adult supervision. Each group will make 2-3 trial dishes, carefully taking notes and measuring their ingredients before deciding on the best version that they want to use as a recipe.

4) Finish by having student trade recipes with another group to make. Challenge them to figure out how to double or triple the recipe. They can post their recipes on-line for others to use and/or cook for parents and other students.

STEM Professional Connection: Have a chef or cook come talk to the students about how they use math in their job and creating recipes.

Using Extra Produce

Length- 1 hour-3 weeks over multiple 15-30 minute timeslots (maybe longer depending on the type of project you and your students decide to take on)

Materials- paper, pencils, clipboards, calculators, scale, computer/phone access

Preparation- you may want to do some investigating of what options are going to be feasible for the extra produce at your school before you have students start this project

1) In school gardens there is often extra produce that isn't eaten by students while they're out in the garden. Having students help decide what to do with the produce is a great way to engage them more deeply in the garden and its future. First talk about this with students. As a whole group, make a list of all the things that you could do with extra produce:

- sell it
- start a farm stand
- donate it to a local charity
- make a big harvest meal for students and family
- serve it in the cafeteria during lunch
- have a tasting table at lunches
- take it home to families

2) Before the group can decide on which of these they want to do, they'll need to see how much extra produce there really is in the garden. Have the students brainstorm how they can figure this out.

One way is to harvest things in the garden and then weigh the harvest with a scale. Ask the students if they think you should do this once or more often? It's probably good to have an idea of how many pounds of produce you're getting from the garden on a weekly basis. If you want to be really thorough, you can harvest things as they ripen everyday over multiple weeks and take that average.

Otherwise, weigh your harvest during one week. You can use this data for various math applications.

Another option is to take a sample of ripe produce from many different garden plants. Weigh a few of these to get the average pound of each. Then count how much more fruit/seeds/leaves/etc. are on each plant and extrapolate how many pounds are on each plant. Use the number of plants to figure out how many pounds of each type of produce will come from the garden.

For example-

- Take five or six ripe tomatoes and weigh them, coming up with an average tomato weight.
- Count the number of tomatoes on a few of the tomato plants. Average these to figure out how many tomatoes each plant will produce.
- Now use the average weigh of a tomato and multiply it by the average number of tomatoes per plant. You now have the average pounds of tomatoes you will get from each plant.
- Lastly, count the number of tomato plants in the garden. Multiply this again by the average pounds of tomatoes and you will know about how many pounds of tomatoes the garden will produce.

3) Now that you have an idea of how much the garden is producing, have the students decide what they want to do with the garden harvest. Some of these options will involve talking or sending emails to local charities, the school principal, district food purchasing staff and cooks. This should be mostly student led with help from adults so they can figure out the pros and cons of each option before settling on one to actually do. Some things to consider whatever they decide:

- Will this be a one-time thing?
- When will we do it?
- Who will be in charge and who do we need to get permission from?
- What do we need to set up to make it happen?
- How much work is this going to be and how much time do we have?
- Knowing what we know now, do we still want to do this?

STEM Professional Connection: This project will require talking to a lot of professionals in the community. Making some of these connections ahead of time or figuring out who the students should email or call will be helpful. Students can speak to people in person, on the phone or through email.

Activities

The activities below can be used to introduce or review the project concepts.

Garden Salad

Length- 15-30 minutes

Materials- produce from the garden, salad spinner, bowls, plates, forks, cutting board and knives

Preparation- gather materials, buy dressing or ingredients to make it
Make a garden salad with students. Salads can be made out of anything in the garden. They can be lettuce based but think about trying a tomato, cucumber or beet base as well. Don't forget fruits and flowers in the salad. The more things students can put in the salad, the more interested they'll be in it. Have the students harvest various fruits and vegetables for the salad in small groups. Make sure to be clear about how much of each thing they should be harvesting. Then wash, tear/chop or grate as needed before tossing it together. Try making up some homemade salad dressings as well. Berry dressings and a simple mix of olive oil and soy sauce are quite popular.

Garden Stir-fry

Length- 30 minutes

Materials- produce from the garden, knives, cutting boards, plates and forks, camping stove w/gas, pan, lighter, wooden spoon, olive oil, soy sauce

Preparation- gather materials, buy ingredients as needed

This is a simple dish you can make with whatever is growing in the garden. Have the students collect produce and herbs to wash and then chop. Sauté the produce in a pan with some olive oil and soy sauce. It's fast, easy and a tasty introduction to cooking for the kids.

Garden Pancakes

Length- 15-30 minutes

Materials- flour, sugar, salt, baking powder, milk/water, vegetable oil, measuring cups/spoons, large bowl, stirring spoon, plates, forks, pan, spatula, camping stove/gas, lighter, cutting boards, knives, grater

Preparation- gather and buy materials

Pancakes are one of the easiest and quickest shortbreads you can make. Add in a camping stove and you can make them right out in the garden. Pancakes are also great because you can add tons of different garden produce- zucchini, berries, squash (precook to save time), other fruit. Or cut the sugar and make a savory version with- kale, tomatoes, spinach, basil, spices, etc.

- 1 cup flour
- 1 tbsp sugar
- 2 tbsp baking powder
- 1/8 tsp salt
- 1 cup milk/water
- 2 tbsp vegetable oil

Drying Apples

Length- 15-20 minutes, 24 hours to dry

Materials- apples, dried apples, apple corer, citric acid or lemon juice, bowl, slotted spoon, food dryer

Preparation- gather materials

Harvest one apple per person. Put an apple on the apple corer and turn the handle until the apple is cored and sliced. Break apart the slices and put them in

the bowl with citric acid or lemon juice. (Explain during the demonstration that the lemon juice keeps the apple slices from turning very brown. The brown doesn't taste any different, but most people like them to stay lighter.) Use a slotted spoon to scoop the apple slices out of the bowl and place them on the food dryer tray, with no overlapping. Let the apples dry for 24 hours.

Jam

Length- 30 minutes to 1 hour

Materials- fruit, bowl for washing fruit and strainer for washed fruit, sugar, pectin, lemon juice, measuring cups and spoons, pot and burner, stirring spoon, containers for finished jam, if canning- another pot for sterilizing glass jars, tongs for removing them

Preparation- gather materials, buy supplies as needed

Have students harvest fruits from the garden- blueberries, strawberries or raspberries. Some students will wash the fruit while others measure out the amount of sugar, pectin and lemon juice you will need. Talk about the difference between canning jam and doing freezer jam. With canned jam you need to boil the jars to sterilize them. (Have an adult demonstrate this if you're going to do it.) It is not needed if you make freezer or refrigerated jam. Follow the instructions on the pectin box. Let each student have a turn to stir or add an ingredient. When finished, pour the jam into jars or containers for the students to take home. If canning you will want to re-boil the now filled jars to seal them.

Pumpkin (or any squash) Butter

Length- 45 minutes

Materials- knife, bowl for holding seeds, strainer for washing seeds, bowl for seeds to sit in salted water, salt, pre-cooked pumpkin, spoons for scooping, another bowl for pumpkin puree, smashing implements, sugar, spices, measuring cups and spoons, pot and burner, stirring spoon, containers, same extra ingredients as above if canning

Preparation- gather materials, pre-cook squash

To do this you'll have three fast rotations or three groups. One will be cutting up a pumpkin and rinsing the seeds then letting them soak in salt water for later baking. Another will be scooping the cooked flesh from a pumpkin that you've already cooked from the rind and smashing it until it's smooth. The last group will be cooking the pumpkin puree, adding the sugar and spices. Make sure that you go over each of these stations with the whole group before starting. Then get to work. If they are rotating, leave work for each group at each station. Finish by pouring the pumpkin butter into jars or containers that the students can take home.

For every 1 1/2 cups pumpkin puree add:

- 1 cup white sugar
- 1 1/2 t ground cinnamon
- 3/8 t ground nutmeg
- 3/8 t ground ginger
- 1/4 t ground cloves

Salsa

Length- 15-30 minutes

Materials- many knives and chopping blocks, tomatoes, peppers, onions, garlic, cider vinegar, cilantro, salt, bowl, stirring spoon, chips to dip in salsa

Preparation- gather materials

This will require a lot of chopping. Harvest and wash the produce first. Then split into teams to get everything chopped. One group can stir ingredients as they're added to the bowl or each group can get a chance to come up and stir. Children often don't like hot things, so hot peppers aren't needed unless they're in the garden anyway. Student who are interested can add them later.

- 5 cups tomatoes
- 2 1/2 cups chopped and seeded green peppers
- 2 1/2 cups chopped onions
- 1 1/4 cups chopped and seeded hot peppers (optional)
- 3/4 cups cider vinegar
- 3 cloves garlic, minced
- 1 tablespoon cilantro, minced
- 1/2 tablespoon salt

Willamette Farm and Food Coalition’s Farm to School Program Food Safety Protocol

date: _____ **school:** _____

Know the source:

- Identify the farm from which the produce came: _____
- Provide farms with ODA brochure “Keeping Produce Safe on the Farm”
- Interview suppliers about food handling practices and make notes
- Determine that practices are consistent with ODA’s recommendations
- Confirm that farm supplying produce has product liability insurance
- WFFC has product liability insurance

_____ (name) supervised this activity and completed checklist

Transportation from farm stand

- Inspect the produce for any visible rot or contamination
- Transport in a clean vehicle
- Transport only in clean, food grade containers that have only been used for food
- Transport produce quickly to its destination.
- Refrigerate perishable items at 41 degrees or below.
- Store food in a clean, dry location where it is not exposed to contamination and at least 6 inches above the floor.
- Wash hands before handling food

_____ (name) supervised this activity and completed checklist

This **Farm to School Program** food safety protocol was developed by **Willamette Farm and Food Coalition** using the following resources:

Oregon Department of Human Services Food Sanitation Rules

US FDA Guide to Minimize Microbial Food Safety Hazards of Fresh-cut fruits and vegetables

USDA Food Safety and Inspection Service website

Lane County Public Health Food Handler Manual

Oregon Department of Education Child Nutrition Program’s materials on Developing a Food Safety Program

WFFC's Farm to School Program Food Safety Protocol
Cooking and Serving Fruits and Vegetables in Classroom Setting

Date:

School:

Teacher:

What we prepared:

- A person in charge holding a food handler's card is designated
 - No one who is helping is sick with a communicable disease, with symptoms such as coughing, sneezing, runny nose, diarrhea, fever, or vomiting.
 - Any wounds or cuts on hands or wrists are covered with a bandage and gloves
 - Clean equipment used for chopping, prepping or storing
 - Wash in hot soapy water
 - Rinse
 - Sanitize with sanitizing solution
 - OR run through dishwasher and allow to dry thoroughly
 - Clean surfaces
 - Wipe surface
 - Sanitize with a solution of 1 tablespoon of bleach in 1 gallon of water.
 - Let the solution stand on the surfaces for a few minutes; then air dry or pat dry with clean paper towels.
 - Wear clean aprons
 - Wash hands before beginning
 - Wash fruits and veggies (gloves aren't needed)
 - Remove any dirt with veggie scrubber and water
 - Wash thoroughly under running water
 - Remove any rotten or damaged areas
 - Servers don't eat until the event is over
 - Use only clean cloths to wipe hands or serving surfaces
 - Wash hands after using bathroom, after touching body parts or unclean surfaces
 - Serve immediately after cooking or keep hot at 140 degrees
 - To taste food while cooking
 - Place small amount in a separate container
 - Step away from exposed food
 - Use a clean spoon
 - Set spoon aside to be washed
 - Wash hands afterward before returning to cooking or serving
 - Clean all serving utensils
 - Wash in hot soapy water
 - Rinse
 - Sanitize with sanitizing solution
 - OR run through dishwasher and allow to dry thoroughly
 - Servers wear gloves and change them if they touch unclean surfaces
 - Food is served with tongs or spoons
 - Kids don't touch the food being offered
 - Kids use clean bowls for seconds or are served without touching their bowl.
- _____ (name) supervised and completed checklist

Farm to School knife safety instructions

Have all kids wash hands with soap and water.

Put cutting mats on tables

And berry baskets for compost on tables and red bowls on tables.

Have an example of everything we brought from farms.

And a few ready to cut up during knife safety demo.

Look what we brought back from the farm! (*show them veggies*)

And we got a few other things from another farm (*show them those*)

We're going to do some cooking today.

We're going to make our own _____!

Everyone is going to help make it and you'll need to chop some things.

We're going to give you a knife for chopping.

It's a real knife. Its sharp. I could cut you if you're not careful.

So we're going to show you how to be safe with your knife. This is important.

If you're not safe with your knife today we'll take it away.

Your knife has two parts. The handle which is plastic. Its either red or black.

You should always hold your knife by the handle.

The other part is metal. One side is flat.

The other side is sharp and shiny (*show them the edge*). This part could cut you, so you shouldn't touch it.

In fact, you should never touch the metal part at all.

Only touch the handle. Hold your knife by the handle.

I'm going to show you how to cut some _____.

I hold the _____ with one hand and my knife with the other.

I cut the stem off and put it in the compost basket on my table.

Then with the rest, I take the knife and press, press, press and slide it a little.

And when I get close to my fingers, even if I'm not done cutting it all, I STOP!

Then I take some _____.

I cut the stem off and put it in the compost basket on my table.

Then with the rest, I take the knife and press, press, press and slide it a little.

And when I get close to my fingers, even if I'm not done cutting it all,

What do I do? (*kids say YOU STOP!*)

Put it into the red bowls on your table, (or someone will come around to get it.)

Great.

When you are sitting and it looks like you are ready for a knife, someone will come around and hand you a knife. (hand out knives)

When you are sitting holding your knife in front of you by the handle,

Someone will come around and give you some _____ to cut.

When you're done with that we'll give you some _____