Train the Trainer:

Farm to School Student Curriculum San Diego County Version 2.0



COMMUNITY HEALTH IMPROVEMENT PARTNERS making a difference together



Tuble of Contents	
Purpose of Train the Trainer Curriculum	4
About the Escondido Agricultural Learning Program	. 5
Acknowledgements	5
Lesson 1: Introduction to Farm to School	. 6
Introduction	. 7
Focus Group Discussion	. 8
Food Miles	13
Harvest of the Month Calendar	14
K-12 Food Miles Activities	16
Wrap-Up Discussion	23
Lesson 2: School Meals, Perceptions, and Advertising	24
Introduction	25
Focus Group Discussion	26
Harvest of the Month Calendar	31
K-12 Balanced Plate Activities	32
Wrap-Up Discussion	42
Lesson 3: Taste	43
Introduction	44
Focus Group Discussion	45
K-12 Taste Activities	47
Wrap-Up Discussion	51
Lesson 4: Farmers and Agriculture	52
Introduction	53
Focus Group Discussion	54
K-12 Farm and Agricultural Activities	56
Wrap-Up Discussion	68
Lesson 5: School Gardens	69
Introduction	70
Focus Group Discussion	71
K-12 Garden Activities	73
Wrap-Up Discussion	77

窃

N

Sur



AS A

E

EZ

Ô

\$

12

3

ħ

<u></u>

3)

Ż

A)

A





\$}

Ð

3

• 6

£

₹¥

Purpose of the Train the Trainer Curriculum

The Train the Trainer Curriculum was created to assist educators in implementing the Farm to School Student Curriculum with K-12th grade students in school, after-school, and extra-curricular programs. This resource was developed through the Escondido Agricultural Learning Program (EALP), an initiative of the Farm to Institution (F2I) Center, to provide more in-depth background knowledge on Farm to School. This entails diving deeper into Farm to School, school meals, the concept of taste, farming, agriculture, and gardens.

Throughout the Train the Trainer, educators will be responding to questions, completing activities, and role modeling portions of the student curriculum. We encourage educators to be an active participant, take advantage of the note-taking pages throughout the binder, and ask questions to increase their knowledge on the topics, as well as to learn best practices for implementing the student curriculum.

As educators go through the Train the Trainer, they should remember that lesson plans from the student curriculum may be completed in order, individually, or in any order the educator would like to implement it as they support their students in learning about Farm to School.

Objectives of the Train the Trainer:

- Understand how to incorporate the curriculum to meet Next Generation Science Standards (NGSS)
- Understand the core elements of Farm to School
- Understand the importance of Farm to School programs
- Recognize the Farm to School activities occurring at schools
- Understand the importance of eating local foods
- Understand how much school meal programs source from local farmers
- Understand how schools plan their meals around seasonal fruits and vegetables
- Identify foods that are locally grown in San Diego County
- Understand the connection between school meals and Farm to School
 - Understand how school meal programs operate

- Understand students' perceptions of school meals and healthy plates
- Understand food and color preferences in school meal programs
- Understand the connection between taste bud receptors and food
- Understand functions of the body related to taste
- Identify preferred tastes
- Identify how to locate farmers in the region
- Understand basic components of farming
- Understand basic challenges farmers face
- Have an increased appreciation for gardens
- Understand how students can get involved in school gardens
- Understand the basics of garden to cafe
- Understand the role gardens play in schools

Next Generation Science Standards:

The Farm to School Student Curriculum was created to align with many Next Generation Science Standards (NGSS) within the elementary grade levels. However, the Farm to School lessons that meet portions of NGSS must work in tandem with an existing science curriculum in order to master the standards. This is beneficial for educators that are seeking to augment their existing science curriculum with topics related to agriculture, gardens, and sensory receptors.

NGSS that overlap with portions of the Farm to School Student Curriculum are denoted on the respective lesson. The letter or number at the beginning of the standard denotes the grade level (e.g. K-ESS3-3 is a kindergarten standard and 4-ESS3-2 is a fourth grade standard.

About the Escondido Agricultural Learning Program

The Farm to School Student Curriculum and Train the Trainer through initiatives of Community Health Improvement Partners' (CHIP) Farm to Institution Center (F2IC) to provide agricultural education to students and to assist educators in implementing the Farm to School Student Curriculum. Revisions of the Farm to School Student Curriculum, development of the Train the Trainer, as well as implementation and evaluation of both curriculums are occuring in 2023-2025 through the Escondido Agricultural Learning Program (EALP) a new program facilitated by CHIP's F2IC.

The Train the Trainer through the EALP works to support increased capacity, sustainability, and ongoing delivery of the Farm to School Student Curriculum. Concurrently, the program focuses on continuous improvement in school meals designed to increase access to healthy and local foods.



Acknowledgements

Thank you to staff from CHIP's Farm to Institution Center, Sandra Avila, Jami Rund, and Yeni Linqui Palomino for their contributions in reviewing and authoring the Farm to School Train the Trainer Curriculum. A special thank you to Farm to School Consultant, Alexis (Anderson) Leong, for her contributions in authoring the Farm to School Train the Trainer Curriculum. Additionally, thank you to Escondido Union School District and San Pasqual Union School District for their collaboration on reviewing, pilot testing, and participating in the Farm to School Train the Trainer Curriculum.

Statement of Funding

This work is supported by the U.S. Department of Agriculture (USDA) Food and Nutrition Service Implementation Project, grant number USDA-F2S-IMPL-2023-CA-1. Any opinions, findings, conclusions, or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

Lesson 1: Introduction to Farm to School

0

LESSON 1: Introduction to Farm to School

Lesson 1: Introduction to Farm to School Estimated time: 2 hours

OBJECTIVE:

This lesson is intended to provide participants an overview of the core elements of Farm to School. Participants will gain insights into the significance of consuming a diverse array of produce and the benefits of supporting local agriculture to the vitality of our communities. Upon completion, attendees will possess an introductory knowledge of the role nutrition plays in fostering healthy growth and sustaining community well-being. It will help participants understand the importance of eating a variety of fruits and vegetables and how purchasing from local farmers helps our communities. Following this lesson, participants will have a basic understanding of the impact of food on healthy development and our communities.

Торіс	Learning Objectives	Content and Core Concepts	Training Activity and Materials
Focus Group Discussion Duration: 45 minutes	 Following this lesson, participants will be able to: Understand the core elements of Farm to School Understand the importance of Farm to School programs Recognize the Farm to School activities occurring at schools 	 Introduction An overview of the core elements of Farm to School School Gardens Nutrition Education Local Procurement Why is Farm to School Important? Eating a variety of fruits & vegetables support healthy development Supporting local farms Learn where our food comes from 	Activities: • Baseline Knowledge • Farm to School 101 • About Farm to School in San Diego County Videos • Reflection Questions Materials: • Appendix B.1 Farm to School 101 • Pencils
Food Miles Duration: 15 minutes	Following this lesson, participants will be able to: • Understand the importance of Farm To School components • Understand the importance of eating local foods • Understand how much school meal programs source from local farmers	 How far does your food travel to get to your plate? How many miles did different fruits & vegetables travel to get to their school? 	Activities: • Food Miles Activity Materials: • Technology with access to internet • Appendix A.2 Examples of Food Miles • Pencils
Harvest of the Month Calendar (Appendix A.3) Duration 10 minutes	 Following this lesson, participants will be able to: Identify foods that are locally grown in San Diego County Understand how their school plans school meals around seasonal fruits & vegetables 	 Locally grown foods Why is it important for schools to purchase from local farms? 	Activities: • Reflection Questions Materials: • Appendix A.3 Harvest of the Month Calendar • Pencils
K-12 Food Miles Activities Duration: 40 minutes	 Following this lesson, participants will be able to: Understand the importance of Farm To School components Understand the importance of eating local foods 	 Guess how many miles the fruit pictured had to travel to get to your school? Guess which fruits can be grown in San Diego. Practice mapping skills to identify food miles. (4-8th Grade) 	Activities: • Appendix B.2 Matching Food Miles Handout • Appendix C.5 Mapping Food Miles Handout Materials: • Appendix A.2 Examples of Food Miles • Appendix B.2 Matching Food Miles Handout • Appendix C.2 Matching Food Miles Answers
Wrap-Up Discussion Duration: 10 minutes	 Following this lesson, participants will be able to: Understand the core elements of Farm to School Understand the importance of Farm to School programs Recognize the Farm to School activities occurring at schools Identify foods that are locally grown in San Diego County Understand how their school plans school meals around seasonal fruits & vegetables 	 Identify key takeaways from lesson 1. Answer any closing questions. 	





Focus Group Discussion:

Objectives:

- Understand the core elements of Farm to School
- Understand the importance of Farm to School programs
- Recognize the Farm to School activities occurring at schools

Next Generation Science Standards (NGSS):

4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Introduction:

The Farm to School Student Curriculum includes five lessons that may be completed in order, individually, or in any order the educator would like to implement it as they support their students in learning about Farm to School.

Lesson 1: Introduction to farm to school is the recommended first lesson as it will create a baseline of knowledge for students as educators move through each lesson with concepts that build off one another. Educators should consider what knowledge their students may already have related to Farm to School before implementing the lesson. This can be done in the form of a pre-test or raised-hand questionnaire. Let's assess your baseline knowledge!

Baseline Knowledge:

1. How do you define Farm to School?

2. What Farm to School activities does your local school incorporate?

WATCH:

Farm School at Solidarity Farm: <u>https://youtu.be/WPXj-w1DvK8</u>

Core Elements of Farm to School

Farm to School enriches community connections with local farmers to bring fresh, nutritious, and local food to schools and early education sites. It increases education and awareness about the connection between regional food systems and student health and well-being, encouraging children and their families to make more informed food choices. It gives students the opportunity to try and learn about new produce, participate in hands-on gardening, learn where food comes from, and strengthen the local economy.

LESSON 1: Introduction to Farm to School



Educational sites may incorporate one or more of the following core elements of Farm to School:



CORE ELEMENT 1: SCHOOL GARDENS

School gardens are a key element of Farm to School as it is a fun and engaging way to get students and families involved in learning about food systems through hands-on engagement. Below are a few of the benefits of school gardens:

- · Provides students the opportunity to be involved in growing their own food
- Increases the likelihood that students will try new produce
- Increases student knowledge of how ecosystems work
- Increase student knowledge of how to plant, grow, and harvest food
- Increases students' awareness of food seasonality
- Provides positive behavioral health benefits from being in nature
- Provides students with an opportunity to get involved in extracurricular activities such as garden clubs
- Increases students' awareness of a potential career pathway
- Provides students and families with fresh produce

WATCH:

- Growing in the Garden with Community Roots Farm [English Version]: <u>https://www.youtube.com/watch?v=0B3mgHP-tmY</u>
- Growing in the Garden with Community Roots Farm [Spanish Version]: <u>https://www.youtube.com/watch?v=QcoATz-vQBM</u>

Reflection Questions:

1. How would you define the role of school gardens in Farm to School at a K-3rd grade level?

2.At a 4-8th grade level?

3.At a 9-12th grade level?

Farm to School Student Curriculum San Diego County

LESSON 1: Introduction to Farm to School



SCHOOL GARDEN RESOURCES IN SAN DIEGO COUNTY:

San Diego County has several organizations that specialize in school garden support. If your school is interested in starting a garden or looking for additional support, see below for a few potential resources:

- The Master Gardener Association of San Diego County assists teachers and parents in starting and maintaining gardens at their schools. Through their website, educators can request a Master Gardener School Garden Consultant. Educators can also access their database to explore other school gardens in the area. To learn more, visit https://www.mastergardenersd.org.
- **Resource Conservation District Greater San Diego County** provides garden resources, trainings, and information to K-12 educators. To learn more, visit <u>https://www.rcdsandiego.org/school-garden-support</u>.
- **Leah's Pantry** offers trauma-informed garden educators that lead guided activities and experiential learning opportunities for students. To learn more, visit <u>https://leahspantry.org/programs/school-garden-program/</u>.
- **Garden 31** collaborates with participating schools in San Diego County to incorporate their School Garden Program that focuses on increasing access to agricultural education and to prepare them for the agricultural workforce. To learn more, visit <u>https://www.garden31.org/school-gardens</u>.
- **Berry Good Food Foundation** awards K-12 schools with grants to support garden projects and healthy food education in San Diego County. To learn more, visit <u>https://berrygoodfood.org/school-gardens/</u>.

CORE ELEMENT 2: NUTRITION EDUCATION

Nutrition education goes hand-in-hand with local food procurement and school gardens by empowering youth with the necessary knowledge and skills needed to make informed food decisions. Below are a few benefits to incorporating nutrition education within classrooms, cafeterias, and after-school programs:

- Introduces new produce to students
- · Educates students on how taste receptors function
- · Provides students with the knowledge on how to build a balanced nutritious plate
- Educates students on how to read food labels
- · Provides students with the knowledge on how to properly fuel their body
- · Educates students on how macronutrients and micronutrients support their body
- · Educates students on fruit freshness, peak nutrition, and flavor
- Educates students on local produce versus imported produce
- Educates students on Organic and regenerative food
- Inspires students to explore a culinary career pathway
- Educates students on how to prepare and cook produce
- Educates students on cultural diversity in food

WATCH:

- Chef Video Series, Christina Ng, Berry Good Food Foundation: <u>https://www.youtube.com/</u> watch?v=KYAYfcXACUE
- Chef Video Series, Cooking with Cultural Diversity: <u>https://www.youtube.com/watch?v=InLj0EJT_pg</u>
- Chef Video Series, Dianna Branche, D'Vine Path: <u>https://www.youtube.com/watch?v=qnG7fp1Ps_U</u>

LESSON 1: Introduction to Farm to School



1. How would you define the role of school gardens in Farm to School at a K-3rd grade level?

2.At a 4-8th grade level?

3.At a 9-12th grade level?

Nutrition Education Resources in San Diego County:

- Refer to in the Farm to School Student Curriculum.
- Refer to in the Farm to School Student Curriculum.
- Partner with local chefs, such as Chef Perla at **Elevation Eating**, to provide nutrition education to students. To learn more, visit <u>https://www.elevationeating.com/food-education</u>.
- Berry Good Food Foundation offers cooking classes for high school and college students to increase their basic life skills, promote local sustainable food, and community. To learn more, visit <u>https:// berrygoodfood.org/cooking-classes/</u>.

CORE ELEMENT 3: LOCAL PROCUREMENT

Local procurement is defined as the purchasing of fruits, vegetables, meat, and goods from local farmers and ranchers. School districts across San Diego County are actively sourcing products from local businesses to provide nutritious local food to students. Local produce can be defined as produce grown within the state of California. Alternatively, local produce can be defined on a more narrow scope - produce grown within the buyer's region of

California or city. Below are some additional benefits to local procurement:

- Strengthens the local economy
- Introduces students to seasonal eating
- Introduces students to new fruits and vegetables
- Provides students with more nutritious and fresh food
- Provides new opportunities for learning about produce
- Provides taste test opportunities (loved it, liked it, tried it)
- Provides opportunities for Harvest of the Month
- · Strengthens opportunities to educate parents on what students are eating at school
- Provides farmers and ranchers with a reliable market channel



LESSON 1: Introduction to Farm to School



WATCH:

Hukama Produce, Growing Relationships: <u>https://youtu.be/uRMarGSyjRs</u>

Reflection Questions:

1. How would you define the role of local procurement in Farm to School at a K-3rd grade level?

2.At a 4-8th grade level?

3.At a 9-12th grade level?

Local Procurement Resources in San Diego County:

- Connect with **CHIP's Farm to Institution Center** to get connected with local farms that are interested in selling to schools.
- Utilize **California Department of Food and Agriculture's (CDFA)** website to learn about school food best practices and funding opportunities such as Local Food for School. To learn more, visit <u>https://cafarmtofork.cdfa.ca.gov/CaFarmtoSchoolProgram.htm</u>.
- Refer to **The California School District Produce Procurement Guide** developed by Community Alliance with Family Farmers (CAFF) and CHIP's Farm to Institution Center. To learn more, visit https://floater.org/wp-content/uploads/2021/11/CAFF-and-CHIP-Procurement-Resource_11.8.21-Final.pdf.

Why is Farm to School Important?

Farm to School is important because it encourages children and families to eat a variety of fruits and vegetables that support healthy development while giving them the necessary energy to focus on their learning. It encourages students to branch out and try new things. It supports local farms by investing in their product and allowing them to invest back into their farm to continue growing and buying new equipment as needed. Farms participating in agri-tourism can offer farm visits to schools to increase students' knowledge on where their food comes from. This also invests money into the farm and allows them to expand their offerings. Farm to School provides a foundation for nutrition education, gardening, learning about ecosystems, environmental impacts, and food miles. It encourages students to explore an agricultural career pathway.

Reflection Questions:

1.What does Farm to School mean to you?

2. How would you explain Farm to School to someone that knows nothing about it?

3.What is one creative way that you could incorporate Farm to School in your life?

LESSON 1: Introduction to Farm to School



Food Miles

A "food mile" is a mile over which a food item is transported to get from a producer or farmer to your plate. For example, if your school meal program sources oranges from a San Diego County farmer and sources bananas from a large distributor that purchases from Costa Rica, the oranges will travel very few food miles, while the bananas will travel much farther over many food miles.

Food miles are important to understand because it highlights:

- the **environmental impacts** of imported food. Food that is imported from another state or country often has to travel on a semi-truck, plane and/or boat, and several other motorized vehicles before it reaches ones plate. This increases the overall carbon emissions for imported produce compared to produce purchased in direct sales with a farmer.
- the differences in **peak fruit nutrition and freshness** in imported produce versus local produce. Produce with many food miles often are harvested weeks before they are ripe to ensure that they do not spoil before getting to the end buyer. Harvesting before peak ripeness decreases the overall nutrient content of a fruit or vegetable. Freshness also decreases as it has been harvested weeks before being served on a plate, compared to local produce that has been harvested within the same week of being served on a plate.

Review Appendix 2 Examples of Food Miles from the Farm to School Student Curriculum.

Food Miles Activity:

Reflect on your last meal and create a list below of the primary ingredients within that meal. If you purchased the item from a farm stand or farmers market, estimate how many miles you traveled to and from your home to purchase the item. If you purchased the item from a store, search on the internet to determine a top producer for that item and estimate the miles that food item traveled. Calculate the estimated total food miles for your last meal.

Food Miles	Ingredients

Total Food Miles: _____

LESSON 1: Introduction to Farm to School



HARVEST OF THE MONTH CALENDAR (APPENDIX A.3)

The Harvest of the Month Calendar will appear as "optional" in several lessons within the Farm to School Student Curriculum. Though it is optional for Lesson 1: Introduction to Farm to School, it can be a great resource to utilize to enhance and expand on the food miles conversation with students. The calendar shows some of the many produce items that can be grown in San Diego County and what season they are typically harvested in.

An educator could use this to introduce the concept of seasonal eating to students. Many large stores and distributors that import food from other states or countries, especially when they are no longer in season within their state. This means the produce one might see in the store could be traveling thousands of food miles from countries like Ecuador or Peru, contributing to negative environmental and less nutritious produce.

Seasonal eating encourages purchasing, preparing, and eating fresh produce that is actively grown and harvested within San Diego County or California. For example, using the Harvest of the Month Calendar, beets are readily harvested and available within the winter months in San Diego County, whereas watermelon is readily harvested and available within the summer months in San Diego County. If a buyer saw watermelon for sale in a store during December, it is most likely being imported from a country that has opposite seasons from the United States.

This can also be a helpful resource for school nutrition directors. If a school purchases produce from a local farmer, the school can be assured that their food is in season, at peak nutrition and freshness, and has minimal food miles. Compared to the produce coming from their large distributor that might be getting imported from outside of San Diego County or California. It is valuable for school cafeterias to promote and offer educational signage related to where their produce is coming from to encourage students and families to implement seasonal eating of produce purchased from local farms in and outside of school.

Reflection Questions:

1. In your own words, describe what seasonal eating is and the importance of it.

2.What is one activity or "homework assignment" you could have your students complete outside of school related to the Harvest of the Month Calendar, seasonal eating, and/or food miles?

A.3 Harvest of the Month Calendar

San Diego's seasonal produce helps communities maintain healthy lifestyle habits.



The Harvest of the Month seasonal calendar for San Diego County was developed by UC San Diego Center for Community Health with input from Community Health Improvement Partners Food Systems' San Diego County Crop Availability Report and Escondido Union, San Ysidro, and Vista Unified School District Nutrition Services.

For more ways to use the Harvest of the Month Calendar, check out the online toolkit: <u>https://ucsdcommunityhealth.org/work/harvest-of-the-month/</u>

LESSON 1: Introduction to Farm to School



K-12 Food Miles Activities

As an educator, it is important to recognize that some activities are better suited for certain age groups. If the activity for a grade level above or below is more appropriate for the students' level, please adjust accordingly. The Farm to School Student Curriculum provides specific activities for grades K-12. The activity options for Lesson 1: Introduction to Farm to School are as follows:

- K-3rd Grade Activity: Where Does Your Food Come From?
- 4-8th Grade Activity: Mapping Food Miles
- 9-12th Grade Activity: Measure the Environmental Impact of Your Meal

Activity Review and Practice (K-3rd Grade): Where Does Your Food Come From?

Materials Needed:

- Appendix A.2 Examples of Food Miles
- Appendix B.2 Matching Food Miles Handout
- Appendix C.2: Worksheet Answers
- Pencils

Instructions:

To begin this activity, the educator will lead a brief conversation on food miles. Refer to page 13 for more information on defining food miles. Keep in mind that this activity is for grades K-3rd and the content and conversation should be at a level they understand.

• Food Miles Explained at a K-3rd Grade Level: A food mile is the measure of how far food traveled from where it was grown to get to your plate. For example, a tomato growing in the school garden is only a few steps away. A banana growing in another country is thousands of miles away. The tomato in the school garden has very few food miles and the banana from another country would travel many food miles.

For this activity, students will complete *Appendix B.2 Matching Food Miles Handout*. The instructions are as follows:

If your school had to purchase all these fruits from outside of San Diego, how many miles do you think they would have to travel to arrive in San Diego? Match the number of miles it travels from where it is grown to arrive in San Diego.

Give students time to work individually or in teams to determine how many miles different fruits and vegetables traveled to get to their school.

This activity will most likely be a guessing game for the majority of students, however, it could include some critical thinking for students that are knowledgeable about where certain fruits are commonly grown. For example, many students might be aware that avocados are commonly grown in Mexico. Have students consider how far Mexico is from San Diego compared to somewhere in the United States or another country, such as China. Have them think critically about whether mileage would be more or less.

Practice time! Complete Appendix B.2 Matching Food Miles Handout and then review the answers.

B.2 Matching Food Miles



Where does your food come from?

If your school had to purchase all these fruits from outside of California, how many miles do you think they would have to travel to arrive in San Diego? Match the number of miles it travels from where it is grown to arrive in San Diego.



LESSON 1: Introduction to Farm to School



Matching Food Miles Answers:

- Avocado = 1,891 food miles: Avocados originated in South-Central Mexico, specifically in the Tehuacan Valley that is roughly 1,891 miles from San Diego County. Mexico is the number one producer of avocados today, but Southern California is also well-known for its avocado production.
- Apples = 1,271 food miles: Apples are grown across the world and have many top producing states and countries. If California were to purchase apples from another location, it would be from Washington (roughly 1,271 miles from San Diego County), as it is a top producing state and is closest to California compared to other top apple producing states. Washington, Pennsylvania, Michigan, New York, and Virginia are all top apple producers.
- **Orange = 5,383 food miles:** Brazil is currently the leading orange producer in the world. An orange from Brazil travels roughly 5,383 miles to arrive in San Diego County. In the United States, Florida has the highest production of oranges, followed closely by California, Arizona, and Texas.
- **Bananas = 2,488 food miles:** In the United States, bananas are grown in warm tropical corners like Florida and Hawaii. Bananas from Florida travel roughly 2,488 miles to get to San Diego County.
- All of the fruits including in this activity (banana, apple, orange, and avocado), can be grown in San Diego County.

Activity Review and Practice (4-8th Grade): Mapping Food Miles Materials Needed:

- Appendix A.2 Examples of Food Miles
- Appendix B.11 Mapping Food Miles
- Appendix C.5 Mapping Food Miles Answers
- Document camera (optional)
- Globe (optional)
- Pencils
- Rulers

Instructions:

To begin this activity, the educator will lead a brief conversation on food miles. Refer to page 13 for more information on defining food miles. Keep in mind that this activity is for grades 4-8th and the content and conversation should be at a level they understand.

• Food Miles Explained at a 4-8th Grade Level: A food mile is a mile over which a food item is transported to get from a producer or farmer to your plate. For example, if your school meal program sources oranges from San Diego County and bananas from Costa Rica, the oranges will travel very few food miles while the bananas will travel much farther over many food miles. Refer to Appendix A.2 Examples of Food Miles for more examples.

For this activity, students will complete Appendix B.11 Mapping Food Miles. The instructions are as follows:

From the fruits and vegetables listed, take an educated guess which location is one of the top producers for that item. Enter the fruit or vegetable into the first blank. Then using the scale, map, and ruler, determine how many food miles each item traveled to the location to arrive in San Diego.

Ex: <u>Potatoes</u> from Idaho travel <u>~1,000</u> miles.

LESSON 1: Introduction to Farm to School



Give students time to work individually or in teams to determine how many miles different fruits and vegetables traveled to get to San Diego County.

This activity involves mapping skills, critical thinking, and perhaps some guess-work. Have students use a process of elimination when determining what states/countries are top producers for each fruit and vegetable. If students are struggling with this part, answer the first blank for each one as a class. Then have them move on to the mapping. It can be helpful to explain the scale ($\frac{1}{2}$ inch = 1,000 food miles, 1 inch = 2,000 food miles, etc.) and show an example using a document camera.

It is also important to explain to students that these measurements vary from a flat map versus a spherical map. This activity is representative of mileage on a flat map and does not necessarily provide an accurate distance.. If you were to measure on a spherical map or Google Maps, the distance would vary. For example, on a flat map, China might appear to be over 13,000 miles away, but in reality, a plane would travel a more direct route that is about 7,000 miles. It is recommended to use a spherical globe (optional) to explain this.

Practice time! Complete numbers 1-4 on *Appendix B.11 Mapping Food Miles*, as well as the question about what can be grown in San Diego County. Then review the answers.

Mapping Food Miles



*Note: Miles reflect the approximate distance food travels from their origin to San Diego County on a flat map. Miles differ on a spherical map.

LESSON 1: Introduction to Farm to School

Mapping Food Miles

From the fruits and vegetables listed, take an educated guess which location is one of the top producers for that item. Using the scale, determine how many food miles the produce item travels to arrive in San Diego.

- 1. _____ from Florida travel _____ mi.
- 2. _____ from Brazil travel _____ mi.
- 3. _____ from Washington travel _____ mi.
- 4. _____ from South-Central Mexico travel _____ mi.
- 5. _____ from China travel _____ mi.
- 6. _____ from Michigan travel _____ mi.
- 7. _____ from India travel _____ mi.
- 8. _____ from Idaho travel _____ mi.

- Bananas
- Potato
- Apples
- Oranges
- Tomato
- Avocados
- Carrot
- Pickling-Cucumber

Which of the food items can also be grown in San Diego Country?

Mapping Food Miles Answers:

- 1. Bananas from Florida travel approximately 2,375 miles.
- 2. Oranges from Brazil travel approximately 6,250 miles.
- 3. Avocados from South Central Mexico travel approximately 1,625 miles.
- 4. **Apples** from Washington travel approximately **1,000 miles**.
- 5. Carrots from China travel approximately 13,500* miles.
- 6. Cucumbers from Michigan travel approximately 2,625 miles.
- 7. Tomatoes from India travel approximately 12,250* miles.
- 8. Potatoes from Idaho travel approximately 1,000 miles.
- 9. Grown in San Diego County: Apples, Avocados, Bananas, Carrots, Cucumbers, Oranges, Potatoes, Tomatoes

*These numbers are representative of mileage on a flat map. If you were to measure on a spherical map or Google Maps, the distance to China would be approximately 6,992 miles and the distance to India would be approximately 8,597 miles.

Note: Answers may vary based on rounding. The purpose of this activity is to get a general idea of how far food travels if it is not grown and purchased in San Diego County.



LESSON 1: Introduction to Farm to School



Activity Review and Practice (9-12th Grade):

Measure the Environmental Impact tf Your Meal

Materials Needed:

- Pens or pencils
- Computer or tablet
- Appendix A.2 Examples of Food Miles
- Appendix A.3 Harvest of the Month Calendar
- Appendix B.3 Measure the Environmental Impact of Your Meal

Instructions:

To begin this activity, the educator will lead a brief conversation on food miles and the environmental impacts of importing food. Refer to page 13 for more information on defining food miles. Keep in mind

- Food Miles Explained at a 9-12th Grade Level: A food mile is a mile over which a food item is transported to get from a producer or farmer to your plate. For example, if your school meal program sources oranges from San Diego County and bananas from a store that imported them from Costa Rica, the oranges will travel very few food miles while the bananas will travel much farther over many food miles. Refer to Appendix A.2 Examples of Food Miles for more examples.
- Environmental Impacts of Importing Foods Explained at a 9-12th Grade Level: Importing food can have several environmental impacts that vary depending on transportation method, production practices from exporting countries, and country specific environmental regulations. Some exporting countries may allow for the use of pesticides and fertilizers that are banned in other countries and could potentially lead to environmental pollution. Foods that are imported tend to be processed and packed for transportation in a way that produces more plastic waste or energy waste. While these foods are being transported, their mode of transportation typically generates greenhouse gas emissions that contribute to climate change. The imported food could also potentially carry pests or pathogens that could harm the local ecosystem if not properly cared for.

For this activity, students will complete *Appendix B.3 Measure the Environmental Impact of Your Meal* worksheet. Students will choose either meal 1 or meal 2 from the worksheet. Using the ingredients from their chosen meal, students will then calculate the food miles for each ingredient utilizing Google Maps. Students will then convert the miles to kilometers rounded to the nearest whole number and then calculate the estimated carbon emissions using the provided equations.

Carbon Emissions (kgCO₂) = Distance (km) × Emission Factor (kgCO₂/km) Kilometers = Miles × 1.60934

- 1. Distance (km): Measure or estimate the distance the food travels from the source to the consumer.
- 2. Emission Factor (kg CO₂/km): This is a value that represents the average estimated amount of carbon dioxide emissions per kilometer for a particular mode of transportation. keep in mind that actual emissions can vary based on factors like vehicle efficiency, load capacity, and fuel type.
- Food Originating in the USA Traveling by Truck (average): 0.5 kg CO₂/km
- Food Originating from Another Country Traveling by Airplane (average): 1.0 kg CO,/km

LESSON 1: Introduction to Farm to School



APPENDIX B.3 MEASURE THE ENVIRONMENTAL IMPACT OF YOUR MEAL



• **Arugula:** Transported from Monrovia, California

- Avocado: Grown by a local farmer in your city
 Bread: Imported from Mexico
- Broccolini: Transported from
- Monterey, California Cherry Tomatoes: Imported from Mexico Eggs: Transported from Monrovia, California



- Avocado: Imported from Mexico
- Basmati Rice: Imported from Thailand
- Beef: Raised by a local rancher in your city
- Black Beans: Transported from North Dakota
- Cheddar Cheese: Transported from Wisconsin
- Cilantro: Grown in your backyard • Corn: Imported from Mexico
- **Onion:** Grown by a local farmer in your city
- Roma Tomato: Grown by a local farmer in your city city

Choose one of the meals above and list the food items and origin in the chart below. Calculate each food item's food miles using Google Maps and convert it to kilometers rounded to the nearest whole number. Using the equations below, calculate the estimated carbon emissions.

Carbon Emissions (kgCO₂) = Distance (km) × Emission Factor (kgCO₂/km) Kilometers = Miles × 1.60934

- 1. Distance (km): Measure or estimate the distance the food travels from the source to the consumer.
- **2.Emission Factor (kg CO₂/km):** This is a value that represents the average estimated amount of carbon dioxide emissions per kilometer for a particular mode of transportation. keep in mind that actual emissions can vary based on factors like vehicle efficiency, load capacity, and fuel type.
- Food Originating in the USA Traveling by Truck (average): 0.5 kg CO,/km
- Food Originating from Another Country Traveling by Airplane (average): 1.0 kg CO,/km

Food originating in your local city should be designated as 10 food miles for this activity. All other food items should be mapped to the respective state or country's capital city for an estimated food miles.

Food Item	Place of Origin	Food Miles (km)	Estimated Carbon Emissions (kg CO ₂)
e.g. Bananas	Mexico	2,826 km	2,826 kg CO ₂
		Total Estimated Meal Carbon Emissions (kg CO ₂ /km)	

LESSON 1: Introduction to Farm to School

Wrap-Up Discussion

Throughout this lesson, participants increased their knowledge on:

- The core elements of Farm to School
- The importance of Farm to School programs
- Recognizing Farm to School activities occurring at schools
- · Identifying foods that are locally grown in San Diego County
- · Understanding how school meals programs incorporate seasonal fruits and vegetables
- Understanding on where food comes from
- Understanding on food miles

Lesson 1: Introduction to Farm to School is intended to provide foundational knowledge to students and educators. The upcoming lessons will continue to expand on many of these concepts.

Reflection Questions:

1. What are three key takeaways from Lesson 1: Introduction to Farm to School?

2.If you were a student (K-12th Grade), what questions might you ask a teacher throughout this lesson and how would you respond?



Lesson 2: School Meals, Perceptions, and Advertising

0

LESSON 2: School meals, perceptions, and advertising

Lesson 1: School Meals, Perceptions, and Advertising Estimated time: 1 hour 30 minutes

OBJECTIVE:

This lesson is intended to provide participants an overview of school meals programs and its relevance to Farm to School, as well as student meal preferences. Upon completion, attendees will possess an introductory knowledge on the history of school meal programs and the important role Farm to School has played in enhancing school meal programs by incorporating fresh local produce. Participants will gain a stronger understanding of student food preferences and strategies to encourage student engagement in trying new foods.

Торіс	Learning Objectives	Content and Core Concepts	Training Activity and Materials
Focus Group Discussion Duration: 30 minutes	 Following this lesson, participants will be able to: Understand the connection between school meals and Farm to School Understand how school meal programs operate Understand students' perceptions of school meals and healthy plates Understand food and color preferences in school meal programs 	 Introduction An overview of school meal programs. An overview of USDA MyPlate. 	Activities: • Baseline Knowledge • Reflection Questions Materials: • Pencils
Harvest of the Month Calendar (Appendix A.3) Duration: 5 minutes	 Following this lesson, participants will be able to: 1. Identify foods that are locally grown in San Diego County 2. Understand how their school plans school meals around seasonal fruits & vegetables 	 Identify locally grown foods. Identify why it is important for schools to purchase from local farms. 	Activities: • Fresh Fruit and Vegetable Photo Cards • Reflection Questions Materials: • Appendix A.3 Harvest of the Month Calendar • Fresh Fruit and Vegetable Photo Cards • Pencils
K-12 Balanced Plate Activities Duration: 45 minutes	 Following this lesson, participants will be able to: 1. Identify nutrients in foods 2. Identify fruits and vegetables that represent the rainbow 3. Understand how to incorporate USDA's MyPlate into daily meals 	 Identify what fruits and vegetables represent each color of the rainbow. Understand and implement USDA MyPlate. Understand basic nutrition. 	Activities: • Eat the Rainbow • Build Your Own School Menu • Nutrition Crossword • Nutrition Jeopardy Materials: • Appendix A.3 Harvest of the Month Calendar • Appendix B.3 Plan Your Own School Menu • Appendix B.4 Eat the Rainbow • Appendix B.4 Eat the Rainbow • Appendix B.4 Eat the Rainbow • Appendix C.6 Nutrition Crossword • Appendix C.6 Nutrition Jeopardy Answers • Appendix C.7 Nutrition Crossword Answers • Fresh Fruit and Vegetable Photo Cards • Computer • Projector • Colored Pencils, Markers, or Crayons • Document Camera (optional) • Food (optional)
Wrap-Up Discussion Duration: 10 minutes	 Following this lesson, participants will be able to: Identify the five primary food groups Explain USDA's MyPlate Identify nutritional components of food Understand the connection between school meals and Farm to School Understand how school meal programs operate 	 Identify key takeaways from lesson 2. Answer any closing questions. 	



Focus Group Discussion

Objectives:

- Understand the connection between school meal programs and Farm to School
- Understand how school meal programs operate
- Understand students' perceptions of school meals and healthy plates
- Understand food and color preferences in school meal programs

Introduction:

The Farm to School Student Curriculum includes five lessons that may be completed in order, individually, or in any order the educator would like to implement it as they support their students in learning about Farm to School. Lesson 2: School Meals, Perceptions, and Advertising is the recommended second lesson as it dives deeper into the role school meal programs have in Farm to School, USDA MyPlate, and nutrition. Educators should consider what knowledge their students may already have related to healthy plates before implementing the lesson. This can be done in the form of a pre-test or raised-hand questionnaire. Let's assess your baseline knowledge!

Baseline Knowledge:

1. What is the role of a school meal program in Farm to School?

2. What are the five food groups and their benefits?

Overview of School Meal Programs:

1. Statewide Universal Meals Program

San Diego County offers a variety of school meal programs aimed at providing nutritious, affordable meals to students across the region. Many schools in California are offering a nutritious breakfast and lunch to all students at no cost under the Statewide Universal Meals Program. For more information on the Statewide Universal Meals Program, visit the California Department of Education at <u>cauniversalmeals.asp</u>. All San Diego County school districts vary and it is important for the educator to learn the unique qualities of their school district's meal program.



LESSON 2: School meals, perceptions, and advertising

APPENDIX A.5 SCHOOL MEAL EXAMPLES







Example 3



LESSON 2: School meals, perceptions, and advertising



2. Local Food for Schools

Each school district is partnered with a primary food distributor and then has varying funding allocated for purchasing local food. Many California schools currently receive additional federal funding through a U.S. Department of Agriculture (USDA) Local Food for Schools (LFS) funding that the California Department of Education (CDE) was allocated. The goal of this funding is to provide eligible school food authorities with additional funding to address supply chain challenges, increase local food purchases in schools, and support local farmers through purchases. Schools currently operating the National School Lunch Program (NSLP) and/or School Breakfast Program (SBP) and have completed the attestation statement only by the respective deadline are eligible to participate. For more information on Local Food for Schools, visit https://www.cde.ca.gov/ls/nu/localfoodforschools.asp.

3. USDA's Definition of Local and Regional Food

"Local and regional food is raised, produced, aggregated, stored, processed, and distributed in the locality or region where the final product is marketed to consumers, so that the total distance that the product travels between the farm or ranch where the product originates and the point of sale to the end consumer is at most 400 miles or within California." (<u>https://www.cde.ca.gov/ls/nu/localfoodforschools.asp</u>)

San Diego County schools often have their own variation of defining local food. Some school districts incorporate the USDA definition and purchase food locally from any region of California, whereas, others define local as their direct community, city, and county.

4. Introduction to the School's Nutrition Requirements

The USDA and CDE are constantly updating the nutrition requirements for school breakfast and lunch programs. This section will provide an introduction to the nutrition requirements that school meal programs follow. Since these requirements are ever changing, it is recommended that an educator connects directly with their school or research on the USDA website to learn more about the most up to date requirements.

In 2022, the USDA released updated meal requirements for the National School Lunch Program and School Breakfast Program. The information in this section provides a brief overview of the 2022 requirements.

- **Fruits:** Fruits can be in the form of fresh, frozen, dried, canned, or 100% fruit juice. Students may select a combination of multiple fruits or a single type of fruit to meet their requirement. The required quantity of fruit is dependent on each age/grade to ensure age appropriate meals and nutrient needs are met.
- **Vegetables:** Vegetables served can be fresh, frozen, dried, canned, or 100% vegetable juice. They should consist of vegetable subgroups such as: legumes (i.e. dry beans), dark green (i.e. kale), starchy (i.e. potatoes), red/orange (i.e. bell peppers), and other vegetables. The required quantity of vegetables is dependent on each age/grade to ensure age appropriate meals and nutrient needs are met.
- **Meat/Meat Alternatives:** Meat and meat alternatives can consist of firm or extra firm tofu, chicken, pork, beef, etc. These foods should meet the dietary specifications for calories, saturated fat, trans fat, and sodium. The required quantity of meat and meat alternatives is dependent on each age/grade to ensure age appropriate meals and nutrient needs are met.
- **Grains:** At least 80% of grains served within a week must be whole grain-rich and 20% or less in a week is allowable for enriched grains. Whole grain-rich is defined as 100% whole grain or a blend of whole grain and flour/enriched grains. Enriched grains are refined grains that have been stripped of

LESSON 2: School meals, perceptions, and advertising



their nutrient density through processing and then nutrients are added after processing (i.e. enriched flour, enriched rice). The required quantity of grains is dependent on each age/grade to ensure age appropriate meals and nutrient needs are met.

- **Milk:** Schools must offer two milk options per meal, with at least one of them being unflavored milk. Water, juice, and other beverages cannot be promoted as an alternative drink option to milk, however, water must be free and accessible during meal services. If a student has dietary restrictions and/or prefers non-dairy milk, a school must receive a written statement from a parent/guardian.
- **Sodium:** Sodium requirements are based on a weekly basis, not daily, allowing a relatively high sodium meal to be served during the week if the remainder of the week's meals are low to moderate sodium levels. Sodium limits are dependent on each age/grade and have maximum limits that must be implemented by year 2027. This timeline allows for schools the time to develop and strategies ways to lower sodium content in menu items they are currently serving.
- **Trans Fat:** The trans fat maximums are referring to added or synthetic trans fats. Naturally-occuring trans fat in meats and dairy products are allowable, but may require documentation from the manufacturer to determine the accurate source of the trans fat.

To review these requirements in more detail, please visit <u>https://www.fns.usda.gov/cn/sp052022-questions-answers-program-operators</u>.

Baseline Knowledge:

1.A common question that schools receive from students is, "Why do I have to take this fruit/vegetable/ milk/etc. if I am not going to eat it?". What is an appropriate response to a student?

2.As an educator, how can you support school meal waste management/prevention as it relates to Farm to School?

Overview of USDA MyPlate:

When discussing nutrition and balanced plates with students, it is important for the educator to not label foods as "good" and "bad", or to put their own personal food preferences/beliefs on the students as this can promote disorded eating. In place of this, an educator should focus on the importance of key nutrients for the body, what the nutrient does, and explaining how to incorporate a balance of each food group. It is also important to relay that every person has different nutrient needs based on their height, weight, sex, physical, and medical needs.

USDA's MyPlate can be a helpful tool for educating students on the five primary food groups: fruits, vegetables, grains, protein, and dairy. As well as a general idea of what portion sizes should be on their plate.



LESSON 2: School meals, perceptions, and advertising



5 Food Groups and their Benefits:

- **Fruits:** Fruits tend to be a lower calorie food that can be high in fiber and potassium. Incorporating fruits into meals will support a nutrient rich diet that might reduce the risk of cancer and heart disease.
- **Vegetables:** A balanced diet includes each of the five vegetable subgroups: dark green, red and orange, legumes, starchy, and other vegetables. Vegetables tend to be a lower calorie food that can be high in fiber and potassium. Incorporating vegetables into meals will support a nutrient rich diet that might reduce the risk of cancer and heart disease.
- **Grains:** Grains have two subgroups, whole grains (i.e. cracked wheat oatmeal, brown rice) and refined grains (white bread, white flour). A diet should include a balance of both subgroups, with at least half of the grains being whole grains. Whole grains support an overall balanced diet and might support weight management and healthy digestion, prevent birth defects, and reduce the risk of heart disease.
- **Protein:** Proteins consist of meat, poultry, fish, eggs, nuts, seeds, tofu, tempeh, beans, and nut butters. Each type of protein includes other beneficial nutrients such as B vitamins, magnesium and zinc. A diet should include a variety of protein options to optimize nutrient intake. Proteins support bone and muscle growth, skin, blood, hormones, vitamins, and calories.
- **Dairy:** Dairy consists of products that are high in calcium and fat, such as; milk, yogurts, cheese, lactose-free milk, and fortified milk and yogurt alternatives. Foods made from milk that are low in calcium and fat (i.e. cream cheese, butter, sour cream) are not included in the dairy food group. Dairy provides many vitamins and minerals (i.e. calcium, phosphorus, potassium, magnesium, vitamin D etc.) that supports bone health and overall health.

To learn more, please visit <u>https://www.myplate.gov</u>.

Reflection Questions:

1. How can you incorporate the Fresh Fruit and Vegetable Photo Cards in the MyPlate discussion/activity?

2. How would you link the concepts of MyPlate to school meals at an age appropriate level?

Harvest of the Month Calendar (Appendix A.3)

The Harvest of the Month Calendar is an optional resource that can be utilized in Lesson 2: School Meals, Perceptions and Advertising. Refer to page 15 of the Train the Trainer for more information.

A.3 Harvest of the Month Calendar

San Diego's seasonal produce helps communities maintain healthy lifestyle habits.



The Harvest of the Month seasonal calendar for San Diego County was developed by UC San Diego Center for Community Health with input from Community Health Improvement Partners Food Systems' San Diego County Crop Availability Report and Escondido Union, San Ysidro, and Vista Unified School District Nutrition Services.

For more ways to use the Harvest of the Month Calendar, check out the online toolkit: <u>https://ucsdcommunityhealth.org/work/harvest-of-the-month/</u>

LESSON 2: School meals, perceptions, and advertising



K-12 Balanced Plate Activities

As an educator, it is important to recognize that some activities are better suited for certain age groups. If the activity for a grade level above or below is more appropriate for the students' level, please adjust accordingly. The Farm to School Student Curriculum provides specific activities for grades K-12. The activity options for Lesson 2: School Meals, Perceptions, and Advertising are as follows:

- K-3rd Grade Activity: Eating the Rainbow
- 4-8th Grade Activity: Plan Your Own School Menu
- 9-12th Grade Activity: Nutrition Crossword
- 9-12th Grade Activity: Nutrition Jeopardy

Activity Review and Practice (K-3rd Grade): Eating the Rainbow Materials Needed:

- Colored pencils, markers, or crayons
- A.3 Harvest of the Month Calendar (optional)
- Appendix A.4 Health Benefits by Color
- Appendix B.4 Eat the Rainbow
- Fresh Fruit and Vegetable Photo Cards* (optional)
- Document Camera (optional)

*Fresh Fruit and Vegetable Photo Cards can be purchased through the California Department of Education at <u>https://cdep.klas.com/product/001650/</u>.

Instructions:

To begin this activity, the educator will distribute *Appendix B.4 Eat the Rainbow* worksheets among students, either to individuals or pairs. Students will draw fruits and vegetables that represent the respective color group on the worksheet. If the school has a garden, consider having students locate fruits and vegetables in the garden for each color of the rainbow. Then have students draw the fruit or vegetable they found in the garden on their worksheet. Encourage students to add color and have fun with it! Give students 10 to 15 minutes to complete the worksheet.

Educators are encouraged to walk around the educational space and engage with students throughout completing the worksheet. Students might need some assistance with brainstorm for certain colors. Instead of giving them direct answers, consider asking open-ended questions such as, "what types of fruits do you see served at breakfast?" or "what vegetables do you see in a salad?"

After students have completed the worksheet, the educator can start a group discussion on what foods the students thought of for each color of the rainbow or have a few students present their worksheets to the class using a document camera.

Consider sharing examples of other fruits and vegetables for each color using the Fresh Fruit and Vegetable Photo Cards. Use *Appendix A.4 Health Benefits by Color* and the Fresh Fruit and Vegetable Cards to review basic nutritional components for each color. Share as much detail that is age-appropriate for the group.

Foods by Color Examples:

- Blue: Blackberry, blueberry, blue potato, plum
- **Green:** Artichoke, avocado, broccoli, cabbage, celery, cucumber, green bean, green pepper, kiwi, lettuce, lime, pea, zucchini
- **Orange:** Apricot, butternut squash, cantaloupe, carrot, mango, orange pepper, peach, persimmon, pumpkin, sweet potato, orange
- Purple: Eggplant, fig, purple cabbage, purple carrot, purple potato, grape
- **Red:** Apple, beet, cherry, cranberry, pomegranate, radish, raspberry, red onion, red pepper, rhubarb, strawberry, tomato, watermelon
- Yellow: Banana, corn, lemon, pineapple, potato, wax beans, yellow pepper, yellow summer squash

Practice time! Complete Appendix B.4 Eat the Rainbow and present to the group.

Eat the Rainbow

Draw/write the name of a fruit or vegetable for each color of the rainbow.



LESSON 2: School meals, perceptions, and advertising

A.4 Health Benefits by Colors

• Red: Vitamin C, Antioxidants

- Vitamin C: Our body cannot make its own Vitamin C, so we need to get it from our food! Vitamin C is important for the immune system and for assisting in healing wounds. During the fifteenth and sixteenth centuries, pirates and sailors suffered from a disease called "scurvy" due to not getting enough Vitamin C. This caused many symptoms including the reopening of previously closed wounds. Citrus fruits with plenty of Vitamin C would have helped prevent this illness.
- Antioxidants: These are molecules that fight free radicals in your body. Free radicals can cause damage to the body's cells if there are too many in the body at once. It is important to eat foods high in antioxidants to prevent this damage.
- White/Brown: Vitamin C, Sulfur Compounds
 - **Sulfur Compounds:** Sulfur helps in making proteins, repairing DNA, and assisting your body with moving food.
- Green: Vitamin C, B Vitamins, Fiber, Minerals
 - **B Vitamins:** B Vitamins play an important role in producing energy and making red blood cells to help your body transport oxygen.
 - **Fiber:** Fiber is the part of plant-based foods that cannot be digested by humans. It is important for digestive health and bowel movements.
 - **Minerals:** Minerals are essential nutrients that help the body perform necessary activities for life. They help your body grow, develop, and stay healthy. Examples of minerals are Potassium and Calcium.
- Blue/Purple: Fiber, Antioxidants
- Yellow/Orange: Antioxidants, Fiber, Potassium, Calcium
 - **Potassium:** A mineral needed for regulating fluid balance, muscle contractions, and nerve signals in your body.
 - **Calcium:** A mineral needed to maintain strong and healthy bones.

A.5 Unique Fruit/Vegetable Origins and Uses

Fruit and vegetable options to use for a taste test:

- **Persimmon:** The persimmon is native to China but was introduced to California in the 1800s where many persimmons still grow today! These fruits are often eaten plain or used in baked goods and salads.
- **Kumquat:** The kumquat is native to China and was introduced to California in the 1880s. They are often used in jellies and jams or as a unique, tart taste in many dishes.
- Loquat: The loquat is another fruit native to China that was introduced to California in the 1850s. Loquats are often eaten plain or used in jams, jellies, and chutneys.
- Kohlrabi: Kohlrabi originated in Northern Europe and was introduced to the United States in the 1800s. It is similar to cabbage and often used in savory dishes and salads or simply eaten fresh with dip.
- **Dragon Fruit:** The dragon fruit is native to Central America. Today, it also commonly grows in Southern California and is often used in smoothies and fruit salads.
- **Passion Fruit:** The passion fruit is native to South America and was introduced to the United States in the late 1800s. This fruit is commonly eaten plain, used in baked goods, or made into juice.
- **Mulberry:** Mulberries are native to China and were introduced to the United States in the 1730s due to the use of mulberry leaves as food for silkworms. Mulberries are commonly used in jellies and jams or eaten plain. They can also be substituted for blackberries in many dishes.
- **Groundcherry:** Groundcherries are native to South America and are closely related to the Tomatillo. They were introduced to the United States in the 1800s and are often used in both sweet and savory dishes. They can be eaten plain, used in a salsa, or used to create jams and jellies.
- **Guava:** Guavas are native to Central America and were introduced to the United States in the 1800s. They are commonly eaten plain, used in jams and jellies, or made into juice.



LESSON 2: School meals, perceptions, and advertising



Activity Review and Practice (4-8th Grade): Plan Your Own School Menu

Materials Needed:

- · Colored pencils, markers, or crayons
- Tablet or computer (optional)
- Hands-On Materials (optional):
 - Avocados
 - Apple
 - Baked good (i.e. brownie, cookie)
 - Cheese
 - Cucumber
 - Hummus
 - Spinach
 - Tomatoes
 - Turkey
 - Whole wheat bread
 - $^{\circ}$ Plate
 - Napkins
 - Serveware
- Appendix A.3 Harvest of the Month Calendar
- Appendix B.3 Plan Your Own School Menu

Instructions:

To begin this activity, the educator will distribute *Appendix B.3 Plan Your Own School Menu Worksheets* and any additional materials needed. Explain to students that they will be creating their own school menu that is appealing to themselves, as well as other students. Their school menu should include all of the components of USDA's MyPlate: dairy, fruits, grains, protein, and vegetables. If age-appropriate, have the students consider how they will present their menu items to make the meal taste good, while also being visually appealing and nutritious.

Students can use the list of food items mentioned on the worksheet or they can get creative developing their favorite meals. If accessible, allow students to use an lpad or laptop to brainstorm creative meals to complete the worksheet. When completing the worksheet, students should deconstruct the meal into each of the respective food categories.

• **Example:** A student wants to serve stir fry. The bok choy, baby corn, and snow peas will be drawn in the vegetable category. The tofu and crushed peanuts will be drawn in the protein category. The mandarin orange will be drawn in the fruit category. The milk served as a drink can be drawn on the side of the meal tray to represent dairy.

Encourage students to add color as this will make the meal more appealing.

LESSON 2: School meals, perceptions, and advertising



Hands-On Activity Options:

In conjunction with the worksheet, consider partnering with the school cafeteria to have students physically build their own food tray using options from the day's breakfast or lunch menu or or supply your students with a few food options from each food group to build their own healthy plate. If supplying food, it is recommended to present all of the food items to the group of students. Have the students categorize the foods into the five food groups. Have the students build their balanced plate consisting of either a nutritious snack or meal that utilizes each food group.

If an educator would like to incorporate more technology, they could have students build their own healthy plate using images of food from the internet and creating a PowerPoint or collage.

After completing the worksheet and/or hands-on activity, have a few students present their meal. In their presentation, have the students share what foods they chose for each food category, what makes their meal appealing to other students, and relevant nutritional components of the meal. If students do not wish to present, lead a group discussion asking these questions.

Practice time! Complete Appendix B.4 Eat the Rainbow and present to the group.

Plan Your Own Healthy Plate

Can you create a tasty, colorful, and healthy school meal using the below food groups?

Vegetables: Lettuce, peppers, cucumbers, peas, carrots, squash, beats, onion, broccoli, brussels sprouts **Fruits:** Orange slices, tomatoes, avocados, kiwis, strawberries, watermelon, pears **Protein:** Chicken, tofu, lentils, almonds, yogurt, tuna **Grains:** Pasta, rice, bread, oats, quinoa

The list of food items mentioned above are examples of the four food groups that this activity is focusing on: vegetables, protein, grains, and fruits. You can use food items from this list or think of your own to make your own healthy plate!

GRAINS	FRUITS	


LESSON 2: School meals, perceptions, and advertising

Activity Review and Practice (9-12th Grade): Nutrition Crossword

Materials Needed:

- Pens or Pencils
- Computer or tablet (optional)
- Appendix B.11 Nutrition Crossword
- Appendix C.7 Nutrition Crossword Answers

Instructions:

To begin this activity, the educator will distribute *Appendix B.11 Nutrition Crossword* worksheets and any additional materials needed. Students may work independently or in pairs to complete the crossword. If the nutrition concepts are new to the students, it is recommended to let them utilize their technology as a resource to complete the crossword.

Practice time! Complete *Appendix B.11 Nutrition Crossword* and then review the answers with *Appendix C.7 Nutrition Crossword Answers*.

LESSON 2: School meals, perceptions, and advertising



Down:

- 1. Supports eyesight
- 2. Consists of fruit, vegetables, proteins, food and banned by the FDA grains, and dairy
- 5. Purchasing of fruits, vegetables, meat, etc. from local farmers and ranchers energy
- 7. A nutrient that is found in avocados, nuts, fish, olives, and dark chocolate
- 8. The process by which the body breaks down food
- 9. A protein that lacks at least one of the nine essential amino acids that the body cannot produce
- 11. School gardens, education, and local procurement
- 12. A nutrient that is found in red meat, cheese, and butter
- 16. Supports bone health and development
- 19. A mineral that supports fluid regulation and muscle contractions
- 22. A fruit that is high in Vitamin C

Across:

- 3. A type of fat that was found in processed food and banned by the FDA
- 4. Supports red blood cell development
- 6. Provide glucose that body cells can use for energy
- 10. A green vegetable that is high in fiber
- 13. Supports digestive health
- 14. Supports protein development and DNA repair
- 15. Hummus with pita bread is an example of a vegetarian-friendly _____
- 17. The amount of energy found in foods
- 18. A yellow fruit that is high in potassium
- 20. Supports the immune system and assists in healing wounds
- 21. Molecules that fight free radicals in the body and prevent damage to the body's cells
- 23. A food item that is high in sulfur that comes from a chicken



LESSON 2: School meals, perceptions, and advertising



Down:

- 1. Supports eyesight
- 2. Consists of fruit, vegetables, proteins, food and banned by the FDA grains, and dairy
- 5. Purchasing of fruits, vegetables, meat, etc. from local farmers and ranchers energy
- 7. A nutrient that is found in avocados, nuts, fish, olives, and dark chocolate
- 8. The process by which the body breaks down food
- 9. A protein that lacks at least one of the nine essential amino acids that the body cannot produce
- 11. School gardens, education, and local procurement
- 12. A nutrient that is found in red meat, cheese, and butter
- 16. Supports bone health and development
- 19. A mineral that supports fluid regulation and muscle contractions
- 22. A fruit that is high in Vitamin C

Across:

- 3. A type of fat that was found in processed food and banned by the FDA
- 4. Supports red blood cell development
- 6. Provide glucose that body cells can use for energy
- 10. A green vegetable that is high in fiber
- 13. Supports digestive health
- 14. Supports protein development and DNA repair
- 15. Hummus with pita bread is an example of a vegetarian-friendly _____
- 17. The amount of energy found in foods
- 18. A yellow fruit that is high in potassium
- 20. Supports the immune system and assists in healing wounds
- 21. Molecules that fight free radicals in the body and prevent damage to the body's cells
- 23. A food item that is high in sulfur that comes from a chicken





LESSON 2: School meals, perceptions, and advertising

Activity Review and Practice (9-12th Grade): Nutrition Jeopardy

Materials Needed:

- Computer
- Projector
- Internet to access Nutrition Jeopardy at https://jeopardylabs.com/play/farm-to-institution-centers-nutrition-jeopardy
- Appendix C.6 Nutrition Jeopardy Answers

Instructions:

- You can access the Nutrition Jeopardy at https://jeopardylabs.com/play/farm-to-institution-centers-nutrition-jeopardy
- Divide the class into 1-10 teams.
- Select "start" and the game board will appear.
- Give each team a turn to select a category and question, and then answer it. Refer to Appendix C.6 Nutrition Jeopardy Answers for a list of all questions and answers. If a student answers the question correctly, click on the green "+" on their team and the point amount will be added to their team. If a student answers incorrectly, click on the red "-" and the point amount will be deducted from the team score. You can also reveal the answer to a question without adding or deducting points by pushing the spacebar on your computer's keyboard. To return to the game board, push "ESC" on your computer's keyboard.
- The game is complete once all the questions are answered. The winner is determined by the team that has earned the most points.

Practice time! Try to answer at least one question from each topic at one of the levels (100 to 500). Topics include: basic nutrition, farm to school, vitamins and minerals, food, and unique fruit and vegetable origins and uses. Refer to *Appendix C.6 Nutrition Jeopardy Answers* for a list of all questions and answers.

C.6 Nutrition Jeopardy Answers

BASIC NUTRITION

100: What are the five components of MyPlate?
Answer: Fruit, vegetables, proteins, grains and dairy
200: What is the amount of energy in food called?
Answer: Calories
300: What is the process in which your body breaks down food called?
Answer: Digestion
400: Hummus with pita bread is an example of what type of protein?
Answer: Complete protein
500: What is it called when a protein lacks at least one of the nine essential amino acids that the body cannot produce?
Answer: Incomplete protein



LESSON 2: School meals, perceptions, and advertising

FARM TO SCHOOL

100: What is a food mile?
Answer: A food mile is a mile over which a food item is transported to get from a producer or farmer to your plate
200: What are the three components of farm to school?
Answer: School gardens, education, and local procurement
300: What is San Diego County the #1 producer of?
Answer: Avocados
400: What is local procurement?
Answer: The purchasing of fruits, vegetables, meats, and other goods from local farmers and ranchers
500: How many acres is considered a small farm in San Diego County?
Answer: Less than 10 acres

VITAMINS AND MINERALS

100: What vitamin supports the immune system and assists in healing wounds?
Answer: Vitamin C
200: What mineral supports bone health and development?
Answer: Calcium
300: What is a type of fat that was found in processed food and banned by the FDA?
Answer: Trans fat
400: What nutrient is found in avocados, nuts, fish, olives, and dark chocolate?
Answer: Unsaturated fat
500: What nutrient supports protein development and DNA repair?
Answer: Sulfur

FOOD

100: What is a fruit that is commonly known to be high in Vitamin C?
Answer: Orange
200: What mineral is highest in bananas?
Answer: Potassium
300: What are two examples of a complete protein?
Answer: Beans served with rice, steak, quinoa, etc.
400: What is an example of foods high in saturated fat?
Answer: Red meat, butter, cheese
500: A food item that is high in sulfur and considered a protein?
Answer: Eggs

LESSON 2: School meals, perceptions, and advertising



UNIQUE FRUIT AND VEGETABLE ORIGINS AND USES

100: What orange fruit is native to China but has grown in California since the 1800s and grows on a tree that is up to 70 ft. tall?
Answer: Persimmon
200: What is a fruit that is native to Central America and commonly eaten in jams and juices?
Answer: Guava
300: What food is native to South America and is closely related to the Tomatillo?
Answer: Groundcherry
400: What is the name of a fruit that is native to China but has grown in California since the 1800s and grows on a very small shrub?
Answer: Kumquat
500: What is the name of a berry that was introduced to the United States to feed silkworms?
Answer: Mulberry

Wrap-Up Discussion

- Throughout this lesson, participants increased their knowledge on:
- Understand the connection between school meals and Farm to School
- · Understand how school meal programs operate
- · Understand students' perceptions of school meals and healthy plates
- · Understand food and color preferences in school meal programs
- USDA's MyPlate and building balanced plates
- The five primary food groups
- Nutritional components of various fruits and vegetables
- · Identifying foods that are locally grown in San Diego County
- · Understanding how school meals programs incorporate seasonal fruits and vegetables

Lesson 2: School Meals, Perceptions, and Advertising is intended to provide foundational knowledge to students and educators on nutrition and school meal programs.

Reflection Questions:

1. What are three key takeaways from Lesson 2: School Meals, Perceptions, and Advertising?

2. If you were a student (K-12th Grade), what questions might you ask a teacher throughout this lesson and how would you respond?



LESSON 3: Taste

Lesson 3: Taste

Estimated time: 1 hours

OBJECTIVE:

This lesson is intended to provide participants an overview of taste and provide opportunities for exploring new flavors. Upon completion, attendees will possess an introductory knowledge on the function of taste bud receptors, five types of taste, and what fruits and vegetables are associated with each taste. Participants will encourage students to be explorers when it comes to taste and might even try a few new foods themselves!

Торіс	Learning Objectives	Content and Core Concepts	Training Activity and Materials
Focus Group Discussion Duration: 20 minutes	 Following this lesson, participants will be able to: Understand the connection between taste bud receptors and food. Understand functions of the body related to taste. Identify preferred tastes. 	 Introduction An overview of how taste bud receptors function. An overview of the five types of taste. 	Activities: • Baseline Knowledge • Reflection Questions Materials: • Pencils • Markers • Notepad (optional)
K-12 Taste Activities Duration: 30 minutes	Following this lesson, participants will be able to: • Identify which tastes are present in fruits and vegetables.	 Identify the different tastes in fruits and vegetables Explore new fruits and vegetables. 	Activities: • Conduct a Taste Test • Mystery Food Game Materials: • Appendix A.5 Unique Fruit/Vegetable Origins and Uses • Appendix B.5 Taste Test Score Sheet • Appetizer forks • 5 oz paper cups • Napkins • Fruits and vegetables (cut into bite size pieces and whole) • Cutting board • Kid safe knives (optional) • Blindfold (optional)
Wrap-Up Discussion Duration: 10 minutes	 Following this lesson, participants will be able to: Explain the different types of taste. Explain how taste buds function. Explain how to distinguish taste in various fruits and vegetables. 	 Identify key takeaways from lesson 3. Answer closing questions. 	

LESSON 3: Taste



Focus Group Discussion

Objectives:

- · Understand the connection between taste bud receptors and food
- Understand functions of the body related to taste
- Identify preferred tastes

Next Generation Science Standards (NGSS):

- 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
- MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Introduction:

The Farm to School Student Curriculum includes five lessons that may be completed in order, individually, or in any order the educator would like to implement it as they support their students in learning about Farm to School. Lesson 3: Taste is the recommended third lesson as it expands on elements from previous lessons. Educators should consider what knowledge their students may already have related to taste before implementing the lesson and adjust accordingly. This can be done in the form of a pre-test or raised-hand questionnaire. Let's assess your baseline knowledge!

Baseline Knowledge:

1. What are the five types of taste?

2.What is an example of a vegetable that represents the taste of umami?

Overview of Taste Bud Functions:

Taste bud receptors are sensory cells located on the oral cavity (tongue, mouth, throat). Taste can also be referred to as gustation. Taste buds are responsible for detecting the different types of taste once food is ingested and sending signals to the brain to be interpreted into the perceptions of flavor. Flavor is a combination of taste and smell. Each taste bud is made of many receptor cells that are embedded in small bumps on the tongue called papillae. There are four primary types of papillae that have functions related to taste buds and mechanical functions to manipulate food. The primary types of papillae and their locations are:

- Fungiform papillae: Taste bud papillae that are found mostly on the tip and sides of the tongue.
- Circumvallate papillae: Taste bud papillae that are found at the back of the tongue.
- Foliate papillae: Taste bud papillae that are found on the sides of the tongue, toward the back.
- Filiform papillae: Support the mechanical movement of food.

WATCH:

• Taste: Anatomy and Physiology, Animation by Alila Medical Media: <u>https://www.youtube.com/watch?v=K9JSBzEEA00</u>

LESSON 3: Taste



Overview of the Five Types of Taste:

It is recommended to utilize the Tongue Taste Buds Diagram when teaching these concepts to show where taste buds are most strongly picking up each type of taste. The entire tongue can detect each type of taste, however, there are sections of the tongue that are more sensitive to specific types (i.e. the back of the tongue is more sensitive to bitter foods).

- 1. Sweet is the taste associated with sugars and other carbohydrates. A sweet taste is often found in fruit, candy, and pastries. Candy has added sugar which makes it sweet, while fruits have natural sugars that give them a sweet, delicious taste. Examples of sweet fruit are watermelon, red apples, and bananas.
- 2. Salty is the taste associated with foods containing salt. It is found in foods such as chips, meats, seasoned vegetables, seaweed, pretzels, and peanuts.
- **3. Bitter** is often associated with sharp, unpleasant, and tart flavors. In nature, bitter tasting compounds can be toxic, which may contribute to this taste being perceived as bad. However, sometimes a little bit of bitterness can add more flavor. You can find bitter tastes in coffee, certain teas, and some leafy greens such as kale or swiss chard. A bitter taste can also be found in dark chocolate.
- **4. Umami** is the taste associated with meatiness. In Japanese, it means "good flavor" and can be found in foods such as soy sauce, mushrooms, and meats.
- 5. Sour is the taste associated with acidity. You will find it in acidic tasting foods such as lemons or other citrus, vinegar, and pickled foods. A sour taste can also be found in oranges, grapefruit, and vinegar.



Tongue Taste Buds Diagram

When identifying the five tastes, students might suggest **"spicy"** as one of the five. However, spicy is not classified as a taste. Spiciness is a sensation caused by certain compounds in foods that activate pain receptors in the mouth. These receptors detect heat and physical abrasion, and might bring a burning sensation in the mouth.

LESSON 3: Taste



Optional Identifying Tastes Activities:

To engage the students further in identifying the types of tastes, have them draw their own tongue taste buds diagram.

Another option is to have students vote on their favorite tastes. First, have the students identify the five tastes and write them on a large notepad or whiteboard. Then write the following questions under each taste:

Which tastes are the most important to you?
 Which tastes would you want to see more on your school menu?

Have each student put a tally mark on the taste that they identify with most for each questions. Then discuss their answers.

Reflection Questions:

1. Recognizing that there are various teaching styles, how would you teach these concepts to K-3rd grades?

2. Recognizing that there are various teaching styles, how would you teach these concepts to 4-8th grades?

3. Recognizing that there are various teaching styles, how would you teach these concepts to 9-12th grades?

K-12 Taste Activities

The discussion prior to and during the activities should be age appropriate (i.e. grades 9-12th should include more discussions around the biology of the digestive system) and dive into concepts further as desired. For lesson 3: Taste, the activities are created for all ages, as all ages can benefit from trying new foods. The activity options for Lesson 3: Taste are as follows:

- All Grades K-12 Activity: Conduct a Taste Test
- All Grades K-12 Activity: Mystery Food Game

LESSON 3: Taste



Activity Review and Practice (All Grades, K-12): Conduct a Taste Test

Materials Needed:

- Appendix B.5 Taste Test Score Sheet
- Appetizer forks
- Compost container or waste basket
- Cutting board
- Dixie cups
- Fruits and vegetables commonly seen at the store (cut in bite-sized pieces)
- Fruits and vegetables commonly seen at the store (whole for display)
- Kid safe knives (if applicable)
- Napkins
- Blindfold (optional)
- Serving platter (optional)

Instructions:

As the educator, determine how much time you have for preparations, the size of the group, and desired level of student engagement. If you have a larger group and have the time to prepare the activity, it is recommended to pre-cut the various fruits and vegetables into bite-sized pieces. Then put the bite-sized pieces in dixie cups to be served with an appetizer fork and napkin. It might be useful to store the cups in a tin tray with a lid or another type of serving platter.

If desired, students can be responsible for cutting their own taste test fruits and vegetables. If utilizing the method, it is highly encouraged to have the students watch a knife safety lesson on YouTube and to use kidsafe knives. To limit the amount of necessary materials (i.e. whole fruits, whole vegetables, cutting boards, and knives), consider having the students in pairs or groups.

For either method, it is recommended to try two to four fruits and/or vegetables. Print *Appendix B.5 Taste Test Score Sheet* for two taste tests or print it on double sided paper to allow for four taste tests. Distribute *Appendix B.5 Taste Test Score* to each student. Explain the rating scale of 1-5 with 1 meaning you "dislike very much" and 5 meaning you "like very much".

Set the ground rules with the class before distributing the taste test items. Choose rules that fit your students and are age-appropriate. A few ideas are:

- 1. Only use the knife as instructed (if applicable).
- 2. If you know what the fruit/vegetable is, don't say it out loud until asked.
- 3. It is okay to dislike a food. Please dispose of it properly.
- 4. Respect other students' food preferences and be kind.

Have a student(s) help distribute the taste test items: napkins, appetizer forks, and taste test cups. Using a blindfold or closing their eyes is optional.

Have the students rate how the food looks, smells, taste, and texture. Educators are encouraged to participate in the taste test and lead a brief discussion on how the students scored each item. Discuss with the students how they could incorporate all five tastes in a meal. After completing the taste test, reveal what the food was and show the fruit or vegetable in its whole form.

LESSON 3: Taste

Practice Time! Work with a partner to role play one of the following:

- Setting ground rules
- Reviewing knife safety
- Administering the taste test

Activity Review and Practice (All Grades, K-12): Mystery Food Game

Materials Needed:

- Appendix A.₅ Unique Fruit/Vegetable Origins and Uses
- Appendix B.₅ Taste Test Score Sheet
- Appetizer forks
- Compost container or waste basket
- Cutting board
- Dixie cups
- Fruits and vegetables that are unfamiliar to the students
 - Cut in bite-sized pieces
 - Whole for display
 - Examples to try: persimmon, kumquat, loquat, kohlrabi, dragon fruit, passionfruit, mulberry, groundcherry, guava
- Kid safe knives (if applicable)
- Napkins
- Blindfold (optional)
- Serving platter (optional)

Instructions:

As the educator, determine how much time you have for preparations, the size of the group, and desired level of student engagement. If you have a larger group and have the time to prepare the activity, it is recommended to pre-cut the various fruits and vegetables into bite-sized pieces. Then put the bite-sized pieces in dixie cups to be served with an appetizer fork and napkin. It might be useful to store the cups in a tin tray with a lid or another type of serving platter.

If desired, students can be responsible for cutting their own taste test fruits and vegetables. If utilizing the method, it is highly encouraged to have the students watch a knife safety lesson on YouTube and to use kidsafe knives. To limit the amount of necessary materials (i.e. whole fruits, whole vegetables, cutting boards, and knives), consider having the students in pairs or groups.

For either method, it is recommended to try two to four fruits and/or vegetables. Print *Appendix B.5 Taste Test Score Sheet* for two taste tests or print it on double sided paper to allow for four taste tests. Distribute *Appendix B.5 Taste Test Score* to each student. Explain the rating scale of 1-5 with 1 meaning you "dislike very much" and 5 meaning you "like very much".

Set the ground rules with the class before distributing the taste test items. Choose rules that fit your students and are age-appropriate. A few ideas are:

- 5. Only use the knife as instructed (if applicable).
- 6. If you know what the fruit/vegetable is, don't say it out loud until asked.





LESSON 3: Taste



7. It is okay to dislike a food. Please dispose of it properly.8.Respect other students' food preferences and be kind.

Have a student(s) help distribute the taste test items: napkins, appetizer forks, and taste test cups. Using a blindfold or closing their eyes is optional.

Have the students rate how the food looks, smells, taste, and texture. Educators are encouraged to participate in the taste test and lead a brief discussion on how the students scored each item. Discuss with the students how they could incorporate all five tastes in a meal. After completing the taste test, reveal what the food was and show the fruit or vegetable in its whole form and what it is commonly used for. Refer to *Appendix A.5 Unique Fruit/Vegetable Origins and Uses*.



LESSON 3: Taste



A.5 Unique Fruit/Vegetable Origins and Uses

Fruit and vegetable options to use for a taste test:

- **Persimmon:** The persimmon is native to China but was introduced to California in the 1800s where many persimmons still grow today! These fruits are often eaten plain or used in baked goods and salads.
- Kumquat: The kumquat is native to China and was introduced to California in the 1880s. They are often used in jellies and jams or as a unique, tart taste in many dishes.
- Loquat: The loquat is another fruit native to China that was introduced to California in the 1850s. Loquats are often eaten plain or used in jams, jellies, and chutneys.
- Kohlrabi: Kohlrabi originated in Northern Europe and was introduced to the United States in the 1800s. It is similar to cabbage and often used in savory dishes and salads or simply eaten fresh with dip.
- **Dragon Fruit:** The dragon fruit is native to Central America. Today, it also commonly grows in Southern California and is often used in smoothies and fruit salads.
- **Passion Fruit:** The passion fruit is native to South America and was introduced to the United States in the late 1800s. This fruit is commonly eaten plain, used in baked goods, or made into juice.
- **Mulberry:** Mulberries are native to China and were introduced to the United States in the 1730s due to the use of mulberry leaves as food for silkworms. Mulberries are commonly used in jellies and jams or eaten plain. They can also be substituted for blackberries in many dishes.
- **Groundcherry:** Groundcherries are native to South America and are closely related to the Tomatillo. They were introduced to the United States in the 1800s and are often used in both sweet and savory dishes. They can be eaten plain, used in a salsa, or used to create jams and jellies.
- **Guava:** Guavas are native to Central America and were introduced to the United States in the 1800s. They are commonly eaten plain, used in jams and jellies, or made into juice.

Wrap-Up Discussion

Throughout this lesson, participants increased their knowledge on:

- The connection between taste bud receptors and food.
- The functions of the body that are related to taste.
- Preferred tastes.
- What tastes are present in certain fruits and vegetables.
- Unique and local produce to San Diego.
- How to encourage students to try new foods.

Lesson 3: Taste is intended to provide a basic understanding of how taste buds function and to have fun exploring new foods and tastes.

Reflection Questions:

1. What are three key takeaways from Lesson 3: Taste?

2.If you were a student (K-12th Grade), what questions might you ask a teacher throughout this lesson and how would you answer?

Lesson 4: Farmers and Agriculture

(ITA)

0

##

LESSON 4: Farmers and Agriculture

Farmers and Agriculture				
	Estimated time: 1 hour 30 minutes			

OBJECTIVE:

This lesson is intended to provide participants an overview of farming and agriculture in San Diego County. Upon completion, attendees will possess an introductory knowledge of farming in San Diego County and the history of farming. Participants will empower students to incorporate agriculture into their lives and explore farming as a potential career pathway.

Торіс	Learning Objectives	Content and Core Concepts	Training Activity and Materials
Focus Group Discussion Duration: 30 minutes	 Following this lesson, participants will be able to: Identify how to locate farmers in the region. Understand basic components of farming. Understand basic challenges farmers face. 	 Introduction An overview of farming in San Diego County. An overview of the history of farming and agriculture in San Diego County. 	Activities: • Baseline Knowledge • Reflection Questions Materials: • Pencils
K-12 Farm and Agricultural Activities Duration: 50 minutes	 Following this lesson, participants will be able to: Understand the resources needed to grow many common foods. Understand the importance of buying local food to support local farmers. Recognize that much of the produce in school meal programs is purchased from local farmers. 	 Show gratitude to local farmers. Highlight the importance of water for farming and growing food. 	Activities: • Write/Draw a Letter to a Farmer • Mystery Food Game Materials: • Blank cards or sheets of paper • Calculator • Envelopes • Pencil, pens, and/or colored pencils • Appendix A.6 Sample Letter to a Farmer • Appendix A.7 Crop and Water Usage Matching Images • Appendix B.6 Crop and Water Usage Matching Worksheet • Appendix B.7 Calculate the Gallons of Water Used on a Farm • Appendix C.3 Crop and Water Usage Matching Worksheet Answers
Wrap-Up Discussion Duration: 10 minutes	 Following this lesson, participants will be able to: Explain common challenges farmers in San Diego County have. Explain the resources needed to grow food. Explain how farming has changed over the years. 	 Identify key takeaways from lesson 3. Answer closing questions. 	

LESSON 4: Farmers and Agriculture

Focus Group Discussion

Objectives:

- · Identify how to locate farmers in the region
- Understand basic components of farming
- Understand basic challenges farmers face

Next Generation Science Standards (NGSS):

- 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.
- MS-LS1-8. Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories.

Introduction:

The Farm to School Student Curriculum includes five lessons that may be completed in order, individually, or in any order the educator would like to implement it as they support their students in learning about Farm to School. Lesson 4: Farmers and Agriculture is the recommended fourth lesson as it expands on elements from previous lessons. Educators should consider what knowledge their students may already have related to taste before implementing the lesson and adjust accordingly. This can be done in the form of a pre-test or raised-hand questionnaire. Let's assess your baseline knowledge!

Baseline Knowledge:

1. How is farming in San Diego County different from farming in other states?

2.What are two common challenges that farmers in San Diego County face?

Farming in San Diego County

There are over 5,000 farmers in San Diego County that supply food to distribution centers, grocery stores, restaurants, schools, prisons, farmers markets, food banks, Community Supported Agriculture (CSA) boxes, and more. Local food grown from these producers tends to be fresher, have a higher nutrient density, and be more environmentally friendly. Many farmers in San Diego County utilize Organic and/or regenerative farming practices, and consider delivery routes that decrease overall food miles and carbon emissions.

LESSON 4: Farmers and Agriculture



Examples of regenerative, climate-smart agricultural practices:

• Farmers incorporate soil health practices such as, **no-tillage or limited tillage**, that limits soil disturbance and allows for the soil to absorb more carbon and reduce the amount of carbon released from the field.

Farmers and ranchers utilize **prescribed grazing** to support the management of vegetation and in results can improve water quality, soil health, and improve carbon sequestration.

Examples of Organic farming practices:

- Organic farmers manage pests, diseases, and weeds through prevention and monitoring methods. They incorporate naturally occurring insecticides derived from plants, and ensure the food does not make contact with prohibited pesticides or fertilizers.
- Organic farmers utilize techniques such as crop rotation (rotating the crops they grow in a field) to increase farm biodiversity, decrease the risk of pests and diseases, and prevent soil erosion.

Farming plays a large role in the local economy and employs almost twenty-three million Americans in the United States. The more local communities invest in purchasing local food, the more farmers have the capacity to invest in the necessary resources to operate a sustainable farm. Each farmers' needs are different and dependent on the crops they are growing. However, the most basic resources that all farmers need are water, labor, fertilizers, compost, land, nutrients, and sunlight.

Farmers in San Diego County face many challenges that can include:

- Weather: Farmers run into weather-related challenges such as flooding from too much rainfall that can cause soil erosion, contaminate the crops, or decrease the soil nutrients. Alternatively, dry seasons with little rainfall can cause a decrease in crop size and quantity and an increase in water prices.
- **Cost of Water:** The cost of water is a major challenge for San Diego County farmers, as water in San Diego County is among the most expensive in the country. Some farms operate on a personal well system that may help keep water prices down, while others are on city water that tends to be more expensive.
- **Competition:** Many farmers in San Diego County are citrus and avocado farmers that often find themselves competing in market channels to sell their products. San Diego County farmers also have to compete with prices of products being imported from Mexico and other countries in Central and South America.

San Diego County is unique to other states in that most of the farms are considered small farms. The average small farm in the United States is 231 acres, while 69% of the 5,000+ farms in San Diego County are between 1-9 acres. For reference, one football field is 1.32 acres. Many of these small farms are family operated and have limited additional staff and labor.

Farming in San Diego County is different to other locations as well due to its weather. San Diego County farmers are able to grow year-round due to Southern California's warm weather and are able to grow fruits and vegetables in each season. In contrast, farmers in many other states are unable to grow during certain seasons due to cold weather. The Harvest of the Month Calendar shows which fruits and vegetables are grown in San Diego County during each season. By following this calendar and eating fruits and vegetables that are in season, you get better tasting and more nutritious food (refer to Appendix A.3 Harvest of the Month Calendar).

LESSON 4: Farmers and Agriculture



To get connected with local farmers, contact Community Health Improvement Partners Farm to Institution Center, the San Diego Farm Bureau, California Department of Food and Agriculture (CDFA), or United States Department of Agriculture (USDA).

Source: County of San Diego, Agriculture Weights and Measures 2018 Crop Statistics and Annual Report, www.sandiegocounty.gov/content/dam/sdc/awm/docs/2018_Crop_Report_web.pdf

History of Farming and Agriculture in San Diego County

Farming and agriculture in San Diego County has changed quite a bit since the early 1900s. During the beginning of the century, San Diego County had a population of only 61,666, and one acre of land would cost a farmer just \$150. Farmers drove trucks full of crops to sell to the public on the side of the highway. The top products farmers grew included lemons, tomatoes, celery, grapes, and alfalfa hay. In addition, agricultural technology has progressed and what was once done by hand, can now be completed with the support of machinery or tools.

San Diego County now has a population over three million and the top farm products include a wide variety of decorative plants such as flowers or shrubs, avocados, cactus, and succulents. Many farmers sell their crops at farmers markets, which are locations set up in communities where groups of farmers sell their crops directly to consumers. Farmers also grow food for restaurants, grocery stores, schools, and community supported agriculture (CSA) boxes. CSA boxes are a type of direct marketing that involves the buyer paying a share of the produce at the beginning of the season to support the farmers growing the crops that will eventually be in their CSA box.

LESSON 4: Farmers and Agriculture



K-12 Farm and Agricultural Activities

As an educator, it is important to recognize that some activities are better suited for certain age groups. If the activity for a grade level above or below is more appropriate for the students' level, please adjust accordingly. The Farm to School Student Curriculum provides specific activities for grades K-12. The activity options for Lesson 4: Farmers and Agriculture are as follows:

- K-12th Grade Activity: Write/Draw a Letter to a Farmer
- 3-5th Grade Activity: Calculate the Gallons of Water Used on a Farm
- 4-8th Grade Activity: Crops and Water Usage Matching

Activity Review and Practice (All Grades, K-12): Write/Draw a Letter to a Farmer

Materials Needed:

- Blank cards or sheets of paper
- Envelopes
- Pens/pencils/colored pencils
- Appendix A.6 Sample Letter to a Farmer

Instructions:

The goal of this activity is for students to practice showing appreciation by writing or drawing thank you cards to local farmers. Start the activity with a brief age-appropriate discussion on gratitude and ways that the students can show gratitude.

The letters can be for a local farmer that provides fruit and vegetables for the school, a farmer friend or neighbor, or farmers at the local farmers market. If opting for farmers that support the school directly, consider connecting with the school's Child Nutrition Services to learn the names of the farms, names of the farmers, and what produce they provide the school. Share these details with students so they can be as specific as they please in their letters. Consider showing the students the farms' websites and any educational videos or virtual farm tours that are available.

Distribute Appendix A.6 Sample Letter to a Farmer, cards, colored pencils, and any other relevant supplies to the students. Offer the use of a template if students would like some guidance and encourage them to use colors if drawing.

Thank You Letter Template (Older Students):

Dear Farmer [name if available],

The [vegetables, fruits, or both] you provide for our school are amazing! My favorite is the [favorite food item the farmer provides]. It is so [favorite quality of the food item the farmer provides (e.g. sweet, delicious, etc.]. Thank you again for growing foods for us to eat!

[Your name]

LESSON 4: Farmers and Agriculture



Thank You Drawing Instructions (Younger Students):

Today we are going to draw a thank you card for our farmer friend who grows food for us to eat at school. Here are some ideas of what to draw/include to thank our farmer(s):

- A big "Thank You!"
- A school
- A farmer
- Your favorite colorful fruits and vegetables
- Don't forget to sign your name

Once the letters or drawings are complete, either mail the letter if you have the farmer's address or give them to the school's Child Nutrition Services to send. (Optional: If the farmer visits the school, have the students deliver the letters in-person)

Practice Time! Write or draw your own template that is age-appropriate for the students you will be working with.

A.6 Sample Letter to a Farmer

Dear Long Road Farm,

The tomatoes and peppers you provided for our school are amazing! My favorite is the cherry tomatoes! They are so delicious!

Thank you again for growing food for us to eat.

From,

Malcom,

4th Grade Student

Avocado Elementary





LESSON 4: Farmers and Agriculture



Activity Review and Practice (3-5th Grades): Calculate the Gallons of Water Used on a Farm

Materials Needed:

- Pencils/pens
- Calculator (optional)
- Whiteboard or document camera (optional)
- Appendix B.7 Calculate the Gallons of Water Used on a Farm
- Appendix C.4 Calculate the Gallons of Water Used on a Farm

Multiplication Methods:

There are different multiplication methods that students utilize. As an educator it is recommended to familiarize yourself with the various methods.

Watch: Box Method Multiplication (2x2), <u>https://www.youtube.com/watch?v=n3q3XzzIGSY</u> Watch: Traditional Method vs. Common Core, <u>https://www.youtube.com/watch?v=9M_CVN9ztso</u> Watch: Multiply Numbers by Drawing Lines, <u>https://www.youtube.com/watch?v=bbKjXKV9QNA</u>

Instructions:

Begin the activity by introducing the scenario below:

Farmer Jeff owns a 3-acre farm in Escondido where he grows tomatoes, avocados, and citrus. In a good month of growing, Farmer Jeff's land is able to produce 34 pounds of tomatoes, 102 pounds of avocados, and 75 pounds of oranges.

Distribute Appendix B.7 Calculate the Gallons of Water Used on a Farm, pens/pencils, and calculators (optional) to students. Consider working through the first problem as a class using a whiteboard or document camera (optional). Depending on time restraints and the mathematical abilities of the class, consider assigning only "odd" or "even" problems. Have students work independently or in pairs to complete the assigned problems.

Once the students have finished the worksheet, review, and discuss the answers as a class.

Practice Time! Complete problems 1-3 using one of the multiplication methods that is new to you.



B.7 Calculate the Gallons of Water Used on a Farm

Calculate Gallons of Water on a Farm

SCENARIO:

Farmer Jeff owns an 8-acre farm in Escondido where he grows tomatoes, avocados, and citrus. In a good month, Farmer Jeff's land is able to produce:

- 34 pounds of tomatoes
- 102 pounds of avocados, and
- 75 pounds of oranges



QUESTIONS:

- 1. If it takes 11 gallons of water to produce 1 pound of tomatoes, how many gallons of water does Jeff use in one month on his tomatoes?
- 2. If it takes 74 gallons of water to produce 1 pound of avocados, how many gallons of water does Jeff use in one month on his avocados?
- 3. If it takes 12 gallons of water to produce 1 pound of oranges, how many gallons of water does Jeff use in one month on his oranges?
- 4. How many total gallons of water does Jeff use on all three of his crops during a month?
- 5. Which of these crops uses the most water? Why do you think this crop uses the most water?

Appendix C: Worksheet Answers

C.1 Farm to School 101

Answers

• The three components of Farm to School: School Gardens, Nutrition Education, and purchasing local fruits and vegetables from local farmers (or local procurement).

C.2 Matching Food Miles Answers

- Bananas 2,488 miles traveled
- Oranges 5,383 miles traveled
- Avocados 1,891 miles traveled
- Apples 1,271 miles traveled
- Items grown locally Avocados, oranges, and apples

C.3 Crop and Water Usage Matching Worksheet

Answers

- Tomatoes 9.8 gallons of water
- Oranges 12.2 gallons of water
- Lettuce 10.8 gallons of water
- Avocados 74.1 gallons of water
- Peaches 42.1 gallons of water
- Strawberries 5.5 gallons of water

C.4 Calculate the Gallons of Water Used on a Farm

Answers

- 1. If it takes 11 gallons of water to produce 1 pound of tomatoes, how many gallons of water does Jeff use in one month on his tomatoes? A:
 374 gallons of water
- 2.lf it takes 74 gallons of water to produce 1 pound of avocados, how many gallons of water does Jeff use in one month on his avocados? **A: 7,548** gallons of water

- 3. If it takes 12 gallons of water to produce 1lbs of citrus, how many gallons of water does Jeff use in one month on his oranges? **A: 900 gallons of water**
- 4. How many total gallons of water does Jeff use on all three of his crops during a month?A: 8,822 gallons of water
- 5.Which of these crops uses the most water? Why do you think this crop uses the most water?

A: Avocados use the most water. Reasons why may vary, but include: avocados grow on large trees, each tree produces a lot of avocados and requires a lot of water, and water is used to transport nutrients to feed avocado trees.

C.5 Mapping Food Miles

Answers

- 1.Bananas from Florida travel ~2,375mi.
- 2. Oranges from Brazil travel ~6,250 mi.
- 3.Avocados from South Central Mexico travel **~1,625 mi.**
- 4. Apples from Washington travel ~1,000 mi.
- 5.Carrots from China travel **~13,500* mi.**
- 6.Cucumbers from Michigan travel ~2,625 mi.
- 7. Tomatoes from India travel ~12,250* mi.
- 8.Potatoes from Idaho travel ~1,000 mi.

*These numbers are representative of mileage on a flat map. If you were to measure on a spherical map or Google maps, the distance to China would be approximately **6,992 miles** and the distance to India would be approximately **8,597 miles.**

- Bananas **~2,375mi.**
- Oranges ~6,250 mi.
- Avocados ~1,625 mi.
- Apples ~1,000 mi.
- Carrots ~13,500* mi.
- Cucumbers ~2,625 mi.
- Tomatoes ~12,250* mi.
- Potatoes ~1,000 mi.
- 6,992 miles
- 8,597 miles

LESSON 4: Farmers and Agriculture



Activity Review and Practice (4-8th Grades): Crops and Water Usage Matching

Materials Needed:

- Pencils/Pens
- Document camera (optional)
- Appendix A.7 Crop and Water Usage Matching Images
- Appendix B.6 Crop and Water Usage Matching Worksheet
- Appendix C.3 Crop and Water Usage Matching Worksheet Answers

Instructions:

Begin the activity with a brief discussion on why plants need water to grow and what they look like when they do not have enough water.

• Display Appendix A.7 Crop and Water Usage Matching Images using a document camera (optional).

Water helps transport important nutrients throughout the plant. Without enough water, plants droop. Water helps a plant grow tall and healthy. The amount of water that a plant needs is dependent on size, shape, and location. Crops that are grown on trees require more water than row crops in the ground as they have more plant matter to move through.

- Distribute *Appendix B.6 Crop and Water Usage Matching Worksheets* and pencils/pens. Have students refer to the matching images to gain a better understanding of how the crops grow (i.e. avocados grow on trees vs. strawberries grow in bushes).
- Give students time to answer the questions and then review the answers. Refer to Appendix C.3 Crop and Water Usage Matching Worksheet Answers.

Practice Time! Get with a partner and explain in your own words how lettuce, oranges, and tomatoes nutrient and water needs vary.

A.7 Crop and Water Usage Matching Images













Farm to School Student Curriculum San Diego County

B.6 Crop and Water Usage Matching Worksheet



Crop and Water Usage

Match the gallons of water it takes to produce 1 pound of each fruit or vegetable. Consider the size and shape of the crop, as well as if the crop is grown on trees or in the ground.



Appendix C: Worksheet Answers

C.1 Farm to School 101

Answers

• The three components of Farm to School: School Gardens, Nutrition Education, and purchasing local fruits and vegetables from local farmers (or local procurement).

C.2 Matching Food Miles Answers

- Bananas 2,488 miles traveled
- Oranges 5,383 miles traveled
- Avocados 1,891 miles traveled
- Apples 1,271 miles traveled
- Items grown locally Avocados, oranges, and apples

C.3 Crop and Water Usage Matching Worksheet

Answers

- Tomatoes 9.8 gallons of water
- Oranges 12.2 gallons of water
- Lettuce 10.8 gallons of water
- Avocados 74.1 gallons of water
- Peaches 42.1 gallons of water
- Strawberries 5.5 gallons of water

C.4 Calculate the Gallons of Water Used on a Farm

Answers

- 1. If it takes 11 gallons of water to produce 1 pound of tomatoes, how many gallons of water does Jeff use in one month on his tomatoes? A:
 374 gallons of water
- 2.lf it takes 74 gallons of water to produce 1 pound of avocados, how many gallons of water does Jeff use in one month on his avocados? **A: 7,548** gallons of water

- 3. If it takes 12 gallons of water to produce 1lbs of citrus, how many gallons of water does Jeff use in one month on his oranges? **A: 900 gallons of water**
- 4. How many total gallons of water does Jeff use on all three of his crops during a month?A: 8,822 gallons of water
- 5.Which of these crops uses the most water? Why do you think this crop uses the most water?

A: Avocados use the most water. Reasons why may vary, but include: avocados grow on large trees, each tree produces a lot of avocados and requires a lot of water, and water is used to transport nutrients to feed avocado trees.

C.5 Mapping Food Miles

Answers

- 1.Bananas from Florida travel ~2,375mi.
- 2.Oranges from Brazil travel ~6,250 mi.
- 3.Avocados from South Central Mexico travel **~1,625 mi.**
- 4. Apples from Washington travel ~1,000 mi.
- 5.Carrots from China travel **~13,500* mi.**
- 6.Cucumbers from Michigan travel ~2,625 mi.
- 7. Tomatoes from India travel ~12,250* mi.
- 8.Potatoes from Idaho travel ~1,000 mi.

*These numbers are representative of mileage on a flat map. If you were to measure on a spherical map or Google maps, the distance to China would be approximately **6,992 miles** and the distance to India would be approximately **8,597 miles.**

- Bananas **~2,375mi.**
- Oranges ~6,250 mi.
- Avocados ~1,625 mi.
- Apples ~1,000 mi.
- Carrots ~13,500* mi.
- Cucumbers ~2,625 mi.
- Tomatoes ~12,250* mi.
- Potatoes ~1,000 mi.
- 6,992 miles
- 8,597 miles

LESSON 4: Farmers and Agriculture

Wrap-Up Discussion

Throughout this lesson, participants increased their knowledge on:

- How to locate farmers in the region.
- Basic components of farming.
- Basic challenges farmers face.
- The resources needed to grow many common foods.
- The importance of buying local food to support local farmers.

Lesson 4: Farmers and Agriculture is intended to provide a basic understanding of the agricultural scene in San Diego County and how farming has changed over the years.

Reflection Questions:

1. What are three key takeaways from Lesson 4: Farmers and Agriculture?

2.If you were a student (K-12th Grade), what questions might you ask a teacher throughout this lesson and how would you answer?



Lesson 5: School Gardens

F

to the

L

(III)

600

Ÿ

谷

##

LESSON 5: School Gardens

Lesson 5: School Gardens
Estimated time: 1 hour and 30 minutes

OBJECTIVE:

This lesson is intended to provide participants an overview of school gardens in San Diego County. Upon completion, attendees will possess an introductory knowledge of the importance of school gardens, what foods can be grown in school gardens, and garden to cafe.

Торіс	Learning Objectives	Content and Core Concepts	Training Activity and Materials
Focus Group Discussion Duration: 20 minutes	 Following this lesson, participants will be able to: Identify the importance of school gardens. Understand how students can get involved in school gardens. Understand the basics of garden to cafe. 	 Introduction An overview of the importance of school gardens. An overview of garden to cafe. School garden resources in San Diego County. 	Activities: • Baseline Knowledge • Reflection Questions Materials: • Pencils
K-12 Taste Activities Duration: 50 minutes	 Following this lesson, participants will be able to: Identify items in the school garden. Have an increased appreciation for the school garden. Understand how plants grow and what is necessary for their success. Create a resource that will assist in growing plants in any space. 	 School Garden Bingo and exploration. How to make seed balls. 	Activities: • School Garden Bingo • Seed Balls Materials: • Pencils/Pens • Stickers (optional) • Potting soil • Pottery clay • Water • Produce seeds • Mixing bowl/container • Peat Pots • Large cardboard box • Appendix B.8 School Garden Bingo • Appendix B.9 Create Your Own School Garden Bingo
Wrap-Up Discussion Duration: 10 minutes	 Following this lesson, participants will be able to: Have an increased appreciation for gardens. Understand the role gardens play in schools. 	 Identify key takeaways from lesson 3. Answer closing questions. 	

LESSON 5: School Gardens



Focus Group Discussion

Objectives:

- · Have an increased appreciation for gardens
- Understand how students can get involved in school gardens
- · Understand the basics of garden to cafe
- Understand the role gardens play in schools

Next Generation Science Standards (NGSS):

- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.
- K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.
- 2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.

Introduction:

The Farm to School Student Curriculum includes five lessons that may be completed in order, individually, or in any order the educator would like to implement it as they support their students in learning about Farm to School. Lesson 5: School Gardens is the recommended fifth lesson as it expands on elements from previous lessons. Educators should consider what knowledge their students may already have related to taste before implementing the lesson and adjust accordingly. This can be done in the form of a pre-test or raised-hand questionnaire. Let's assess your baseline knowledge!

Baseline Knowledge:

1.Why are school gardens important?

2. How can the school garden and cafeteria collaborate?

Overview of the Importance of School Gardens:

School gardens provide more than just nutritional benefits, they provide opportunities to support physical activity, mental health, education, community building and much more.

• Time in the garden provides many opportunities for physical activity: endurance, flexibility, balance, and strength. Activities such as digging, weeding, planting, watering, and harvesting utilize many of these types of physical activity.

LESSON 5: School Gardens



- Gardens provide the space for meditation, mindfulness, and breathwork in nature that supports student mental health.
- Gardens provide opportunities for project-based learning and education through STEAM (science, technology, engineering, art, and mathematics).
- Gardens provide a space for the community to work together and support one another. It creates a space for students to interact with volunteers and potentially locally farmers!

Overview of Garden to Cafe:

Garden to Cafeteria (GTC) is a program in which students grow and harvest fruits and vegetables from a school garden to go to the schoo's cafeteria. Important food safety protocols are followed to reduce the risk of contamination. Some examples are food safety checklists, approved produce lists, signature pages, and log sheets. School and retail food facilities regulated under the California Retail Food Code are required to obtain their food from an "approved source" as defined in sections 113725 and 114021 of the California Health and Safety Code.

The USDA provides policies to allow a School Food Authority (SFA) to use funds to purchase school garden produce. SFAs may use these funds to pay for products from the school garden, such as investing in seeds, seedlings, and garden projects. The SFA enters into an agreement with the school to provide produce to the cafeteria from the school garden at a fair market price.

For more information on the importance of school gardens and garden to cafe, review CHIP's Flourishing Wellness Through Farm to School at <u>http://f2icenter.org/wp-content/uploads/2023/03/Flourishing-Wellness-Through-F2S-1.pdf</u>

School Garden Resources in San Diego County:

San Diego County has several organizations that specialize in school garden support. If your school is interested in starting a garden or looking for additional support, see below for a few potential resources:

- The Master Gardener Association of San Diego County assists teachers and parents in starting and maintaining gardens at their schools. Through their website, educators can request a Master Gardener School Garden Consultant. Educators can also access their database to explore other school gardens in the area. To learn more, visit https://www.mastergardenersd.org.
- Resource Conservation District Greater San Diego County provides garden resources, trainings, and information to K-12 educators. To learn more, visit <u>https://www.rcdsandiego.org/school-garden-support</u>.
- **Leah's Pantry** offers trauma-informed garden educators that lead guided activities and experiential learning opportunities for students. To learn more, visit <u>https://leahspantry.org/programs/school-garden-program/</u>.
- **Garden 31** collaborates with participating schools in San Diego County to incorporate their School Garden Program that focuses on increasing access to agricultural education and to prepare them for the agricultural workforce. To learn more, visit <u>https://www.garden31.org/school-gardens</u>.
- Berry Good Food Foundation awards K-12 schools with grants to support garden projects and healthy food education in San Diego County. To learn more, visit <u>https://berrygoodfood.org/school-gardens/</u>.
LESSON 5: School Gardens



K-12 Garden Activities

As an educator, it is important to recognize that some activities are better suited for certain age groups. If the activity for a grade level above or below is more appropriate for the students' level, please adjust accordingly. The Farm to School Student Curriculum provides specific activities for grades K-12. The activity options for Lesson 5: School Gardens are as follows:

- K-5th Grade Activity: School Garden Bingo
- K-12th Grade Activity: Seed Balls

Activity Review and Practice (K-5th Grades): School Garden Bingo

Materials Needed:

- Pencils/Pens
- Prize (optional)
- Appendix B.8 School Garden Bingo
- Appendix B.9 Create Your Own School Garden Bingo

Activity Review and Practice (K-5th Grades): School Garden Bingo

Students will explore their school gardens and green spaces through a competitive scavenger hunt. Educators will have the option to create their own Bingo worksheet using the template, *Appendix B.9 Create Your Own School Garden Bingo*, or use *Appendix B.8 School Garden Bingo*. They will look for the items listed on the School Garden Bingo worksheet in the school garden and surrounding areas. To complete the activity, students will need to complete a "bingo" (5 boxes in a row) either vertically, horizontally, or diagonally. For a little more of a challenge, have the students complete a "coverall", a bingo pattern where you must cover the whole card.

There might be items on the School Garden Bingo worksheet that the students are not familiar with yet (i.e. compost bin). The educator should provide hints or educate students in the moment if they ask for guidance. Once students complete their "bingo" or "coverall", review their worksheet and ask where they found two to three of the items to ensure they completed it accurately. Consider awarding a prize for completion such as Farm to School sticker or fresh snack from the garden.

Once the group has completed their worksheets, bring them back together to discuss what they learned about the school garden.

Practice time! Using Appendix B.9 Create Your Own School Garden Bingo, create your own bingo worksheet.

B.8 School Garden Bingo



School Garden

B	Ι	N	G	0
COMPOST	LADYBUG	A SHADY TREE	BUGS	SOIL
LETTUCE	PLANTING POTS	BUMBLEBEE	HERBS	GARDEN GLOVES
HOSE	EARTHWORM	FREE SPACE	PEAS	WEEDS
BUTTERFLY	ROOT VEGGIES	SEEDS	TOMATOES	A FRUIT TREE
RAISED BED	WATERING CAN	NICE SMELLING	SPIDER OR SPIDER	SHOVEL

B.9 Create Your Own School Garden Bingo



SCHOOL GARDEN

B	Ι	N	G	0
		FREE SPACE		

LESSON 5: School Gardens



Activity Review and Practice (K-5th Grades): School Garden Bingo

Materials Needed:

- Large batch recipe:
 - 2 cups of potting soil
 - 5 cups of pottery clay
 - 1-2 cups of water
 - 1-2 cups of seeds of your choice
 - Large bucket or tub to mix together
 - Large box to dry and store finished seed balls
- Small batch recipe:
 - 2 parts of potting soil
 - 5 parts of pottery clay
 - 1-2 pinches of water, as needed
 - 1-4 seeds of your choice
 - 1 peat pot per student
 - Small container
 - Large box to dry and store finished seed balls

Instructions:

Seed balls are made of clay, soil, seeds, and water to help reseed land that has lost its natural flora. The seed balls are able to conserve moisture, germinate, and then slowly crumble to start the root into the ground. The clay around the seeds help to protect from heat, wind, and heavy rains.

Determine if the group will be making one large batch of seed balls or if each student will be making one seed ball. Refer to Master Gardeners Vegetable Planting Guide to determine what seeds to plant per the seasons: <u>https://www.mastergardenerssandiego.org/Vegetable%20Planting%20Guide1.pdf</u>

Follow the instructions accordingly:

Large Batch:

- 1.Combine 2 cups of potting soil, 5 cups of pottery clay, and 1-2 cups of seeds of your choice in a large tub.
- 2. Mix ingredients thoroughly so there are no lumps.
- 3.Add water slowly until the mixture is the consistency of molding clay.
- 4.Knead the dough to incorporate the seeds and add more water if necessary.
- 5.Roll the mixture into balls that are 1 inch in diameter. If the mixture is not sticking together, add more water.
- 6.Let the seed balls air dry for 24-48 hours in a shady place before planting. Use a cardboard box to store and dry them.
- 7.After drying, let the students take them home to plant or plant them in the school garden. Carefully place or gently toss the seed balls onto a section of soil to plant them. Avoid burying or watering them immediately.

LESSON 5: School Gardens



Small Batch:

- 1.Before starting the lesson, prepare the supplies into individual small containers with enough ingredients to make one seed ball. Prepare the supply containers the same day to ensure the pottery clay does not dry out.
- 2. Distribute the pre-made supply containers to the students.
- 3.Combine 2 parts of potting soil, 5 parts of pottery clay, and 1-4 seeds of your choice.
- 4. Mix ingredients thoroughly so there are no lumps.
- 5.Add a small pinch of water slowly until the mixture is the consistency of molding clay.
- 6.Knead the dough to incorporate the seeds and add more water if necessary.
- 7.Roll the mixture into balls that are 1 inch in diameter. If the mixture is not sticking together, add more water.
- 8.Let the seed balls air dry for 24-48 hours in a shady place before planting. Use a cardboard box to store and dry them.
- 9. After drying, let the students take them home to plant or plant them in the school garden. Carefully place or gently toss the seed balls onto a section of soil to plant them. Avoid burying or watering them immediately.

Seed Ball Recipe Source: https://www.gardeningknowhow.com/special/children/making-seed-balls.htm

After completing the activity, have a discussion with the students about the benefits of planting seeds and growing their own food.

Practice time! Make your own individual seed ball.

Wrap-Up Discussion

Throughout this lesson, participants increased their knowledge on:

- The importance of school gardens.
- How students can get involved in school gardens.
- The basics of garden to cafe. How to locate farmers in the region.
- How plants grow and what is necessary for their success.

Lesson 5: School Gardens is intended to provide a space for exploration and learning in the garden through interactive activities.

Reflection Questions:

1. What are three key takeaways from Lesson 5: School Gardens?

LESSON 5: School Gardens



2. If you were a student (K-12th Grade), what questions might you ask a teacher throughout this lesson and how would you answer?

3. What new insights did you gain from this curriculum?

4. How will you adapt these lessons to fit your school's unique needs?

5. What challenges do you anticipate in implementing these lessons, and how might you overcome them?

LESSON 5: School Gardens



Notes



The Farm to Institution Center | Community Health Improvement Partners 5095 Murphy Canyon Road Suite #105 | San Diego, CA 92123 | (858) 609-7960