

Foodways

Oak Meadow Teacher Manual

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Introduction

Foodways: Sustainable Food Systems is a course that explores what we eat, why we eat it, and how we get our food. Historical events, cultural traditions, social structures, geographic features, and economic practices all factor into our food choices and options. As your student progresses through the course, they may learn uncomfortable truths about food scarcity, loss of food diversity, and food justice issues. Having the opportunity to discuss what they are learning will help students process this information and give them a voice in working toward change and access to healthy food for all.

The student's coursebook contains all the instructions and assignments for this single semester, 18-week course. Throughout the course, students will be doing research and reading using additional sources such as nonfiction books, websites, and videos. A list of the curriculum resources used in this course can be found online at oakmeadow.com/curriculum-links/.

In addition, students are required to choose one book to read related to food systems. There is a list of possible choices in lesson 2; students are encouraged to choose and acquire the book within the first month of starting the course. The book reading will be completed by lesson 7; students needing more time to read will want to get the book earlier.

This teacher manual is designed to help you support your student as they move through this course. In addition to factual answers to assignment questions, you will find tips on how to assess student responses, and suggestions for ways to guide your student's learning.

You may want to look over the teacher manual answers before your student begins work on a lesson. There are notes on how to support your student and alternate options that may be helpful.

In this teacher manual, you will find the full text for all assignments and activities. Teacher manual answers are seen in orange. If you are homeschooling independently, this teacher manual can serve as your support as you guide and evaluate your student's work. When a student gets a factual answer wrong, you can share the correct answer and address any underlying misconceptions. Several incorrect answers related to a particular topic point to an area the student will benefit from revisiting.

For obvious reasons, it is best not to share this teacher manual with your student. Each student is expected to produce original work, and any incidence of plagiarism should be taken very seriously. If you notice a student's answers matching those of the teacher manual word for word, a discussion about plagiarism and the importance of doing original work is necessary. While students in high school are expected to be well aware of academic honesty, any discussion about it should be approached as

a learning opportunity. Make sure your student is familiar with when and how to properly attribute sources (there's an extensive section on this in the appendix of the student's coursebook).

We encourage you and your student to explore the topics of this course together. Food systems and food access affects every human being. By taking an interest in what your student is learning, you convey the sense of the vital importance of this work.

Lesson



What Is Food?

Learning Objectives

At the end of this lesson you will be able to:

- Explain the process of photosynthesis.
- Classify foods as carbohydrates, proteins, or lipids.
- Draw a diagram of a photosynthetic food chain.

Watch

Watch these two videos (click on the Foodways tab at oakmeadow.com/curriculum-links/ for the online links):

Biological Molecules: You Are What You Eat

Photosynthesis and the Teeny Tiny Pigment Pancakes

The first video gives an overview of the chemical structures of carbohydrates, proteins, and lipids (fats). The second video explains how photosynthesis converts sunlight, carbon dioxide, and water into glucose (food). These short videos contain a lot of information so you may want to watch them more than once.

The videos in this course help explain the concepts students are working with. It may be helpful to watch the videos with your student, or to encourage the student to discuss different concepts with you. By explaining or talking about these ideas, students can gain a more complete understanding.

ASSIGNMENT SUMMARY

- Read “What You Need to Know.”
- Watch the two videos.
- Explain the process of photosynthesis.
- Classify foods as carbohydrates, proteins, or lipids.
- Find out about traditional foods in your family.
- Create a diagram of a photosynthetic food chain.
- Activity: Food Journal

Think About It

Photosynthesis is an essential process upon which nearly all life on Earth depends. Explain the process of photosynthesis to someone else—a child, a friend, or an adult. Drawing a diagram might make your explanation easier to understand.

Discussion elements are included in this course to give students regular opportunities to think about, explain, and debate topics that are central to this course. Students are encouraged to discuss topics with a wide range of people: peers, family, professionals, and friends.

Assignments

1. List examples of carbohydrates, proteins, and lipids (fats) that you eat on a regular basis. (You may want to make your list after you complete Activity: Food Journal.)

Student answers will vary and may include some of the following:

Carbohydrates: bread, potatoes, pasta, rice, sugar

Proteins: meat, eggs, fish, beans, nuts, cheese

Lipids: oil, mayonnaise, butter, ice cream

2. Think about special meals you have shared with your family or friends. What are some of the things you ate? Ask your family members or friends the history of some of the special foods that were shared in the past. Were these foods they ate as children? Were the foods part of an ethnic tradition or from a certain geographic region? Is there a special dish that has been prepared the same way for generations, or that has been changed a little bit with each generation? Write down what you learn.

This assignment asks students to learn more about foods that are important to their family's culture and traditions. Answers should include specific details about ingredients and the family or cultural history of the food. Students will hopefully note whether favorite dishes have evolved over the generations or are still made in the traditional way. Many modern families find creative ways to substitute healthier options for certain traditional ingredients (such as using coconut oil instead of lard) or techniques (such as baking instead of deep frying). Some substitutions may be made on the basis of intentional dietary choices, such as making a traditional dish meat-free or gluten-free.

3. Create a labeled diagram of a photosynthetic food chain based on a meal you've recently eaten. Remember to title and label your diagram.

The diagram should begin with the sun, since all food chains begin with energy from the sun. The chain should include green plants (producers) at the 1st trophic level, non-human animals (primary consumers) at the 2nd trophic level, and humans (secondary consumers)

at the 3rd trophic level. The diagram should be titled, correctly labeled and clearly convey the information.

Activities

Complete the following activity.

Activity: Food Journal

This week, you will create a food journal. Note all the foods and beverages that you consume in three consecutive days, and measure or estimate the amounts (such as 2 eggs, 1 cup of chips, 8 ounces of milk). Try to be specific about the ingredients of each meal. For instance, if you have a smoothie, it might include yogurt, bananas, strawberries, and milk; if you have a pizza, it might include mushrooms and pepperoni (you don't have to write down "tomato sauce" or "cheese" since those are regular pizza ingredients). Write down all meals, snacks, desserts, and drinks—everything you eat or drink goes on the list, even if it is a very small quantity. It is best to write things down as soon as you eat them rather than waiting until the end of the day to try to remember everything.

Keeping a food journal can be challenging but it is a revealing activity. The journal should include three full days of data, and show all meals, snacks, desserts, and drinks. Students are asked to estimate amounts and note individual ingredients when possible. Look for well-organized data presented in a format that is easy to understand.



Up for a Challenge?

Learn how to prepare a special dish or a family favorite. Write down the recipe (if it is not already written down) and ask an adult to help you make it or show you techniques you are unfamiliar with. Feel free to add your own flair to the dish and make it your own!

This is an optional activity (all Challenge activities are optional).

Challenge activities are always optional. Students who are interested in the topic or who wish to learn more are encouraged to try any of the challenge activities that appeal to them.

Lesson



The Food Web

Learning Objectives

At the end of this lesson you will be able to:

- Differentiate between autotrophic and heterotrophic organisms.
- Explain the soil food web.

Read and Watch

Watch the following videos (see oakmeadow.com/curriculum-links/ for the online links):

What Is the Soil Food Web?

Autotrophs vs. Heterotrophs

Read this article from the National Resources Conservation Service:

“Soil Food Web”

ASSIGNMENT SUMMARY

- Read “What You Need to Know.”
- Watch the two videos.
- Read an article about the soil food web.
- Add information about heterotrophic and autotrophic organisms in your food chain diagram.
- Describe the soil food web.
- Choose a book to read and explain your choice.

Assignments

1. Return to the diagram of the food chain you created for the previous lesson. On the diagram, note which organisms are heterotrophic and which are autotrophic. For the heterotrophic organisms, label each one as herbivore, carnivore, omnivore, or scavenger.

For this assignment, students add to the food chain diagram they created in lesson 1. Heterotrophic organisms consume carbon to grow and develop; this category includes humans, animals, and microorganisms. Autotrophic organisms are ones that use photosynthesis to create food (plants). Each heterotrophic organism in the diagram should be labeled either herbivore (plant eater), carnivore (meat eater), omnivore (plant and meat eater), or scavenger (organisms that feed on decaying plants and animals).

2. Describe in your own words the soil food web. Explain how a healthy soil system works and then describe a scenario showing what might happen if one element is out of balance. Include specific details in your explanations.

The soil food web refers to the connection between organisms in the soil in their never-ending cycle of growth, development, and decay. Soil organisms break down organic matter (such as leaves and dead animals) to microscopic pieces, releasing nutrients into the soil. These nutrients feed plant growth, which in turn feeds animal growth. The organisms in the soil also provide other chemical components that make the soil rich, such as oxygen and space to make water accessible. The soil food web consists of organisms feeding and consuming one other to survive. If one element is out of balance, the whole system can break down. For instance, if there is inadequate water, the plants will fail to thrive so they will deliver fewer nutrients into the soil for soil organisms to decompose, so the soil will become less rich. If a pesticide is used to harm one particular soil organism, that organism's link in the chain is broken, and the cycle is disrupted. The main point that students should note is that all parts of the system are interrelated and interdependent.

3. Choose one of the following books to read (check with your teacher if you'd like to read an alternate selection). Each one gives a different perspective on how the food system works.
 - *The Color of Food: Stories of Race, Resilience and Farming* by Natasha Bowens
 - *One Straw Revolution* by Masanobu Fukuoka
 - *Eating the Landscape: American Indian Stories of Food, Identity, and Resilience* by Enrique Salmón
 - *Stuffed and Starved: The Hidden Battle of the World Food System* by Raj Patel
 - *Omnivore's Dilemma* by Michael Pollan
 - *Blessing the Hand that Feeds Us: What Eating Closer to Home Can Teach Us About Food, Community, and Our Place on Earth* by Vicki Robin
 - *Animal, Vegetable, Miracle* by Barbara Kingsolver
 - *Consumed: Food for a Finite Planet* by Sarah Elton
 - *Food and the City: Urban Agriculture and the New Food Revolution* by Jennifer Cockrall-King
 - *The 100 Mile Diet: A Year of Local Eating* by Alisa Smith and J.B. MacKinnon
 - *Botany of Desire* by Michael Pollan
 - *Real Food, Fake Food* by Larry Olmsted
 - *Farm City* by Novella Carpenter
 - *Epitaph for A Peach* by David Mas Masumoto
 - *Deeply Rooted: Unconventional Farmers in the Age of Agribusiness* by Lisa Hamilton

Look up the description of each book online or in the library and consider each one before you make your decision. Choose your book this week and explain why you chose it.

A 500-word essay on your book selection will be due at the end of lesson 11/12; a rough draft of your essay will be submitted with lesson 8. You should acquire the book as soon as possible, and then, based on the book length, create a reading schedule that allows you to finish the book in four weeks—this will give you two weeks to write your rough draft.

Use the following prompts to frame your essay:

- What is the main topic or theme of the book? What do you think is the author's main message or purpose in writing it?
- Does the author have experience or expertise related to the book's topic?
- What information in the book did you find surprising or particularly interesting?
- What are some of the questions raised by the book? Do you have any questions based on the reading?
- While reading, take note of any passages that intrigue you or capture your attention. Use one or more of these passages in your essay. Include a page number and citation.

These guidelines are not meant to be followed step by step; they are to help you focus on the key ideas in the book so that your essay can convey these ideas effectively.

Students will consider each of the book choices. The chosen book should be acquired as soon as possible from a library or bookseller. Students should note which book was chosen and why.

Lesson



Soil: The Good Earth

Learning Objectives

At the end of this lesson you will be able to:

- Compare and contrast soil types.
- Describe the different soil horizons.
- Demonstrate soil layers using food.

Read and Watch

Read the following articles (online links are found at oakmeadow.com/curriculum-links/):

“Soil Health” (Natural Resources Conservation Service)

“Soil Types” (soils.org)

When reading “Soil Types,” click on several of the soil types to see photographs and compare the different soils.

Watch these two videos:

Introduction to Soil (Part 1)

Soil and Soil Dynamics

Assignments

1. Visit the webpage “State Soils,” found at the bottom of the “Soil Types” article listed above. Click on your state (or choose a state if you live outside the U.S.) and read the information about your state’s soil. Study the photo of the soil profile. Then choose another state in a different area of the country and view that soil profile. Are the soil profiles similar or different? Describe your findings.

ASSIGNMENT SUMMARY

- Read “What You Need to Know.”
- Read two articles.
- Watch the two videos.
- Compare the soil composition of two different regions.
- Activity: Edible Soil Layers

Using the information found on the USDA Natural Resources Conservation Service website as well as information from the soil texture triangle (found in the student coursebook), students will compare soil from two different geographical regions. They should note both similarities and differences in the two soil profiles. This assignment requires students to absorb material from multiple sources and create a comparison based on their current knowledge.

Activities

Complete the following activity.

Activity: Edible Soil Layers

In this activity, you will create a delicious and educational dessert for your family or friends! If possible, take pictures of the process as you are creating your dessert. Afterward, explain what ingredients you used for each layer or draw a diagram and label each layer. Make something you will enjoy eating!

1. Begin by planning each layer of soil. Try to find ingredients that match the consistency and color of the layers. Some ideas for each layer are below; choose one or come up with your own alternative.
 - Bedrock: cookie, graham cracker, pie crust
 - Parent material: chocolate chips, raisins, almonds
 - Subsoil: chocolate pudding, peanut butter, yogurt
 - Topsoil: chopped nuts, cookie crumbles, graham cracker crumbles
 - Worms and other organisms: carrot peels, gummy worms, sesame and poppy seeds
 - Organic matter: shredded coconut, grated apple, chopped dried fruit
2. Once you have chosen your layers, prepare the ingredients.
3. Layer your edible soil in a glass dish so that the layers can easily be seen. Remember to start with the bottom layer and build up the soil layer by layer.
4. Take a picture of the finished dessert, and then grab a spoon and dig in!



Up for a Challenge?

Watch the second *Introduction to Soil* video to learn about how to take an accurate soil sample.

Introduction to Soil (Part 2)

All Challenge activities are optional. This video provides specific information on different methods of soil sampling used in field work. Even without a core sample and lab analysis, students can learn a great deal by using a shovel and analyzing the soil by hand.

Lesson



Cultivating Food

Learning Objectives

At the end of this lesson you will be able to:

- Give examples of modern hunter/gatherer experiences.
- List the origin of a variety of foods.
- Explain how to grow a favorite food.

Read and Watch

Check out this interactive map (all online links are found at oakmeadow.com/curriculum-links/)

“Where Our Food Crops Come From”

Use it to look around the world for some of your favorite foods. Where did they originate?

Next, watch this video:

Origins of Agriculture

ASSIGNMENT SUMMARY

- Read “What You Need to Know.”
- Examine an interactive map and watch a video.
- Provide examples of modern-day hunting and foraging.
- List the origin of different foods.
- Find out how to grow a favorite food.
- Begin reading your book selection.

Think About It

Imagine a time in human history when people were just beginning to domesticate animals. Some would have been used to provide meat, fur and leather for clothing, and eggs or milk, while others would have been domesticated for the services they could provide: protection, work, and companionship. If you were in charge of domesticating animals for your village, which animals would you choose? Why? Discuss this with someone else and find out what animals they might choose.

Assignments

1. Many people today hunt, fish, and forage for food. Describe your experience with these activities, or the experiences of someone you know. Do you consider hunting and gathering food to be essential skills today? Why or why not?

Some students may feel they do not hunt or gather food anymore and that it is not a necessary skill. Others will find it easy to identify experiences they've had with hunting, fishing, and foraging for food. Students may note these skills are still important to learn today, in case of an emergency (such as being lost or cut off from a food source), economic hardship, or a natural disaster. Answers will vary as to food-gathering experiences, and may include berry picking (wild blueberries, strawberries, or blackberries), clamming or crabbing, fishing, and gathering wild greens (such as dandelion or miner's lettuce) and herbs.

2. Using the online interactive map "Where Our Food Crops Come From," (from the Read and Watch section above), compile the following data:
 - a. Make a list of at least five of your favorite foods and where they originated.
 - b. Look up the main ingredients of the traditional family food or special meal you wrote about in lesson 1. Make a list of the origins of each of the ingredients. If possible, note whether the food origins are close to the ethnic or cultural origins of your ancestors.

Students will compile information about where different foods originated from the online interactive map and display the data in two lists. The lists should be clearly labeled and organized so it is easy to see the different food types and regions of origin. If possible, students are asked to note whether the food sources of the traditional family meal they wrote about in lesson 1 match the family's cultural or ethnic origins.

3. Choose one of your favorite plant-based foods and find out how it grows. Imagine you want to cultivate the plant so that you can eat it whenever it is ripe. Can you obtain seeds for it? Does it grow from separating the roots of the parent plant? What are the specific conditions it needs to thrive? Will it grow in your area? Learn what you can and write and/or draw a brief description of what you have learned.

Answers will vary. The student's response should have specific information about one type of plant and how it is propagated and cultivated.

4. You should have your reading book by now. Begin reading, and continue reading each week so that you have completed the book by lesson 6 or 7. Take notes as you read so you have the basic material compiled when you sit down to write your rough draft, which is due at the end of lesson 8.

Depending on the length of the chosen book, you may want to check on your student's progress over the next few weeks.

Lesson



From Farm to Plate

Learning Objectives

At the end of this lesson you will be able to:

- Create a diagram showing one food moving through the food system.
- Explain the key elements of organic and permaculture farming practices.
- Construct a sculpture from natural materials.

Watch

Watch the following videos (see oakmeadow.com/curriculum-links/ for all online resources):

Earth's Systems Interact

Food System Components

Assignments

1. Think about your favorite plant-based food you learned about in the previous lesson (assignment #3). Create a labeled diagram that shows the food moving through each of the systems you learned about, from natural resource, through production, processing, distribution, etc. If possible, find out where and how this food is produced, processed, and distributed in your area. If you are unable to find all the information you need, use what you have learned to create a diagram that shows a reasonable representation of what happens. Include as many details as you can. For instance, instead of just showing the food being “processed,” explain that the food is picked by hand (or machine), washed, sorted by size, and placed in shipping crates. Be specific! You can draw your diagram by hand or create it on a computer. Make sure the diagram is titled and labeled, with clear descriptions of each nested system.

ASSIGNMENT SUMMARY

- Read “What You Need to Know.”
- Watch two videos.
- Draw a food systems diagram.
- Research and write an essay on sustainable farming practices.
- Activity: Natural Sculpture

The goal of this assignment is for students to show, in diagram format, their understanding of the many systems that are connected in the process of bringing food from farm to table. Look for specific details of each stage of the process and a realistic sense of the journey a food takes from growing in the soil to being consumed. For instance, after harvesting, it might be washed, mashed, dried, roasted, or combined with other ingredients before packaging.

2. Learn about these two sustainable farming practices: organic farming and permaculture. What are the similarities and differences between them? In your own words, write an essay (two to four paragraphs) that explains and compares the key features of each system. Focus on what you found most interesting; don't just try to report the basic facts. Think about how these farming practices fit into a sustainable food system and highlight the systems within the systems.

List your sources in MLA format at the end of the essay, and if you quote any sources directly in your essay, use quotation marks and include an in-text citation. Take notes as you conduct your research and organize them into a rough draft. Review your rough draft, or give it to someone else to read for feedback. Revise the rough draft to help you express your ideas more clearly, to make your writing more engaging, and to help your ideas flow better. Proofread the revised draft to catch any lingering errors or awkward phrasing. Following these steps of the writing process will help you produce a competent and expressive essay. This essay will be due at the end of the next lesson, so you have two weeks to complete it.

This is a major essay, and students have two weeks to complete it. They are expected to do research, take notes, and explain—using their own words—the basic principles and differences between organic farming and permaculture design.

Organic farming uses methods of soil enhancement and pest management that are free of pesticides, growth hormones, genetically modified organisms, and other manufactured additives. Biological diversity and soil health are maintained with a wide range of natural methods, including crop rotation, cover crops that enrich the soil, beneficial insects, and companion planting.

Permaculture methods look at the farm or ecosystem in terms of the relationships between the elements, and seek to balance them in a sustainable way. For instance, a permaculture farm might allow some crops to go to seed and reseed naturally, and focus on growing crops that are well suited to growing on that particular piece of land. The garden or farm would be designed as a whole of interconnecting parts rather than in separate, self-contained parcels. The variety of plants and animals on the farm are viewed as interrelated parts of the system, and the health of the soil is carefully nurtured.

The student's final essay should show effective organization, clear writing, and evidence of proofreading. A list of research sources should be included, written in MLA format.

Activity: Natural Sculpture

To strengthen your own awareness of the natural resources around you, make a sculpture from natural materials. This can be anything from a rock tower or stick hut to a sculpted hedge or braided wreath of dried grasses.

For inspiration, visit this page of the Cornell University website:

“Living Sculpture”

Take some time to search all the different ideas on this site and then find one you like, based on the natural materials you’ll be able to find. Or come up with your own idea. Use as many natural materials as possible. For instance, instead of string to hold pieces together, see if you can find a tough, flexible grass or vine that will work. If you need to “glue” something together, can you use mud to do it? Let your imagination go and have fun creating something unique!

When you have finished, you may want to leave your sculpture along a woodland path or near your mailbox where others can see and enjoy it. It will eventually decompose, like all natural materials, and return to the soil as part of the resource/waste system.

Take a picture of your sculpture, if possible, to share with your teacher, or write a brief description and draw a sketch.



Up for a Challenge?

If you enjoy making a living sculpture, consider designing one on a larger scale and organize it as a community project. Or you can plan a more long-term project, such as creating a “sunflower house” for a local preschool by planting a border of sunflowers around a sandbox (don’t forget to leave room for a doorway!). As the sunflowers grow during the summer, they will shade the children playing in the sandbox. Another popular idea is to construct a simple teepee from sturdy saplings with a play space inside—again, remember to leave a space for children to get in and out. Plant peas and beans around it. As the peas and beans grow, they will dangle down inside the play space so the children can harvest them when ripe.

This is an excellent challenge to encourage interested students to do. Because it involves a community element, it beautifully illustrates the connectedness of systems within the student’s own life.