🕤 American Museum 🖱 Natural History

Educator's Guide



OUR GLOBAL KITCHEN FOOD NATURE CULTURE

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thestoryoftexas.com/education/educators/activity-guides



How does food reflect and influence culture and identity?

Food and culture are profoundly intertwined. Every meal tells a story about the culture that shaped it, when it was eaten, and by whom and when and where it was served. Recipes and ingredients have always traveled, and different civilizations may use the same food in distinct ways. For example, chile peppers native to the Americas are both a celebrated staple of Mexican **cuisine** and an essential ingredient in kimchi, the national dish of Korea. Culinary traditions change over time, influenced by geography, climate,

economics, trade, and individual creativity. Recipes, both oral and written, gave food its own language. We know from an ancient cookbook that ingredients from Persia, Central Asia, and China blended into inventive feasts in the court of Mongolian ruler Kublai Khan. Modern examples of fusion cuisine include pineapples on pizza and sweet plantain in sushi.



Before refrigeration, access to vegetables during winter was difficult. Koreans often made huge batches of kimchi, salted and fermented vegetables preserved in pots and sometimes protected from early spring sunshine by small grass huts.

What's the role of human ingenuity in shaping food – past, present, and future?

Over the centuries, humans have created a spectacular diversity of foods to suit our needs, which range from higher yields and drought resistance to bigger size and better flavor. We farm in backyard plots and large-scale commercial operations, and adapt to regional conditions as well as the global marketplace. We use longstanding techniques such as irrigation and **selective breeding**, and new ones like genetic modification of plants and animals. **Arable land** is finite, so farmers are working on ways to produce more food sustainably and distribute it more efficiently. Ingenuity doesn't stay on the farm. We've developed many ways roasting, pickling, and microwaving, to name just a few — to transform raw ingredients into a fantastic range of flavors, recipes, and cuisines.

How does what we eat affect the planet?

Decisions about food — how and where it's grown, how it's processed, and how it reaches our plates — all affect the environment. Our collective choices reflect trade-offs between productivity and environmental impact, between economic and social priorities. Clearing land for agriculture alone contributes as much as 12% of global carbon dioxide

emissions annually, and methane, another greenhouse gas, is released by livestock and rice cultivation. This increase in greenhouse gases is causing the climate to warm. Fertilizers and pesticides can pollute widely, and 70% percent of the world's available fresh water that humans use goes to crops and livestock. Fishing is a key source of protein for billions of people, but almost 90% of global marine fisheries are under pressure and entire marine ecosystems have been devastated. Transporting food between far-flung markets has an environmental cost as well. Global demand for food is increasing — along with global per capita demand. Despite all the effort that goes into producing food for people to eat, one third of it never reaches their mouths. In the developed world, much food is wasted after it reaches the consumer, and throughout the world much is lost while grown or stored.

Why is the diversity of food important?

Whether farms or forests, healthy ecosystems are biodiverse: home to a variety of living things. Healthy, resilient agricultural ecosystems replenish soil nutrients and support a range of crops and livestock, along with pollinators and the natural enemies of pests. Monocultures — where a single variety of a crop is cultivated in a given area — are less able to adapt to changes in weather or pest populations. American farmers experienced this in 1970 when their corn crop was devastated by southern corn leaf blight. Healthy meals, like healthy ecosystems, also involve diversity. There are many different ways to meet nutritional needs, and diets change as we encounter new flavors and dishes. Many ingredients in our kitchen cabinets come from different countries, broadening our nutritional and culinary options.

What's the role of food in human health?

Humans convert food into energy and the vitamins and minerals it contains keep us healthy. The amount of food a person requires varies according to weight, sex, energy output, and **metabolism**, and changes with age. What we eat affects our health and wellbeing. Too much, too little, or the wrong kinds of foods - like ones with an abundance of salt, sugars, and fats, or lacking in nutrients — can make people sick. Cultural factors that include habits, family income, ethnic heritage, attitudes toward body size, advertising, and peer pressure influence nutritional choices and eating patterns. Fewer than 5% of Americans are **undernourished**. but around 15% are **food insecure**. By causing poor health, low energy levels, and even mental impairment, insufficient calories can reduce people's ability to work and learn, leading to more poverty and even greater hunger. While an estimated one in every eight people, or 870 million, around the world is undernourished, more than a billion are overweight or obese — conditions associated with chronic health problems. A moderate, balanced diet is key to human health.

GLOSSARY

arable land: land suitable for growing crops

biotechnology: using living biological organisms or processes for various purposes, including production of drugs, hormones, and genetically modified foods

calorie: a unit of energy, provided in food by carbohydrates, proteins, and fats

commodity: bulk agricultural product that can be sold and traded, such as wheat or soy

cuisine: a set of cooking practices and traditions, often associated with a particular region or culture

domestication: altering wild plant and animals at the genetic level by selective breeding to accentuate traits that benefit humans

fishery: an area where fish are harvested (wild) or farmed (aquaculture)

food security: stable access to enough food and the ability to prepare it in a healthy way

greenhouse gas: gases that absorb solar energy and reemit it as infrared energy that warms Earth's atmosphere

metabolism: the set of chemical reactions that maintain life within organisms

organic farming: farming that does not use synthetic fertilizers and relies on natural or mechanical methods for weed and pest control

selective breeding: breeding members of the same species for desirable traits

undernourishment: too little food for good health. Malnutrition — too little of the right kinds of nutrients — can involve under or over nourishment.

THE SCIENCE OF TASTE

Your tongue and mouth are filled with taste buds. Each cell in these bundles senses a single **taste** — sweet, sour, bitter, salty, or umami (savory) — and sends this chemical information to the brain. In order to sense **flavors**, your brain integrates information about taste, along with texture, temperature, and input from the other senses: your eyes (red drinks likely taste sweet!), your ears (celery has to crunch!), and above all your nose. Odor molecules are inhaled through your nostrils and also pass between your throat and nasal cavity as you chew. These messages travel to the brain, which can tell thousands of aromas apart. All of this sensory input combines to make it possible to enjoy countless subtle flavors, like the difference between strawberry and cherry jellybeans. Preferences ---whether you like spicy foods or unusual flavors, for example — can be shaped by many factors, including anatomy, genetics, evolution, culture, memory, and marketing.

COME PREPARED

Plan your visit. For information about reservations, transportation, and lunchrooms, visit www.thestoryoftexas.com/education/field-trips.

Read the Essential Questions in this guide to see how themes in *Our Global Kitchen* connect to your curriculum. Identify the key points that you'd like your students to learn.

Review the Teaching in the Exhibition section of this guide for an advance look at the models, artifacts, and interactives that you and your class will be encountering.

Download activities and student worksheets

at thestoryoftexas.com/education/educators/ activity-guides. Designed for use before, during, and after your visit, these activities focus on themes that correlate to the Texas Essential Knowledge and Skills Standards.

Decide how your students will explore the *Our Global Kitchen* exhibition.

- You and your chaperones can facilitate the visit using the **Teaching in the Exhibition** section of this guide.
- Your students can use the **student worksheets** to explore the exhibition on their own or in small groups.
- Students, individually or in groups, can use copies of the **map** to choose their own paths.

Teaching in the EXHIBITION

Food is fuel — and so much more. Our food choices connect all of us: families, cultures, and the billions of people with whom we share ingredients, cuisines, and the planet itself. Feeding this growing global population will require meals that meet our nutritional needs, safeguard the environment, and still delight us with their textures and flavors.

Use the **guided explorations** below to help your students investigate how food is grown, how it reaches our markets and kitchens, how cooks and cultures create cuisines, and the role of food in ceremony and celebration. (Possible answers follow each question.)

Our Global Kitchen Theater

A video towards the beginning of the exhibition describes how everything we eat affects — and is affected by — the world around us. Invite students to watch the video and keep this theme in mind as they walk through the exhibition.



TRADE

GROW

OVERVIEW: Over the centuries, humans have created countless varieties of crops and livestock adapted to local conditions. We've also come up with many different ways to grow food, which involve factors that range from climate and soils to available energy and technology.

GUIDED EXPLORATIONS:



Domesticated chickens produce up to 300 eggs a year. Their closest wild of Southeast Asia, lays 10 to 15.

• "Reshaping Our Foods" wall:

Most domesticated species barely resemble their wild ancestors. Have students look at these examples of plants and animals we raise for food and identify ones they recognize. (e.g. chicken, strawberry, sheep, potato, chile) ancestor, the red junglefowl Ask them what aspects have been transformed by humans. (e.g. yield, size, shape, taste)

• Agriculture mini-dioramas, vertical gardens, & "Future of Growing" cases: All plants require water, light, and a growing medium (e.g. soil) in order to thrive. Have students compare and contrast farming methods. What techniques help people farm successfully around the world? What are some challenges they face? (e.g. large-scale

farming produces high yields at relatively low prices; uses chemicals and a great deal of water; depletes the soil) How are farmers addressing these challenges? (e.g. in densely populated urban areas farmers use rooftop garden beds, vertical gardens, and hydroponic growing technology)



On diversified farms like this one, farmers grow crops and raise animals in ways that sustain natural ecosystems.

OVERVIEW: From sacks of spices to shiploads of grain, food moves along complex trade networks: between corporations and governments, from markets to restaurants, even among families and neighbors.

GUIDED EXPLORATIONS:

• Aztec marketplace diorama: Walk through the giant marketplace near Tenochtitlán in 1519 with your students. Food and other items were carried to this capital city from all over the thriving Aztec Empire (now Mexico). Invite students to examine what's for sale and to identify foods that look familiar. (e.g. peppers, tomatoes, corn) What common foods are missing? (e.g. bread, cheese, chicken) Have them find chocolate in different forms and explore how the Aztecs used it. (e.g. *beverage, currency, tribute to conquerors, offerings to gods)*



Vast and well organized, the market of Tlatelolco served up to 60,000 people a day. Beyond its walls loomed the Aztec city's great pyramid.

• "Modern Markets" map & trade interactive: Food might come from your garden — or from the other side of the world. Have students explore how and why foods move around the world.

соок

OVERVIEW: Over time and across civilizations, cooking has given rise to a fantastic diversity of tools, techniques, and cuisines.

GUIDED EXPLORATIONS:

· Cooking objects, preservation methods, & utensils:

People in almost every culture around the world cook. Have students explore similarities and differences in the ways cultures around the world preserve and prepare food. (e.g. high-heat cooking in China, grinding corn in Mesoamerica.



French chefs are famous for using copper pots, like those in this kitchen. Copper, an excellent conductor of heat, has been used in cooking for thousands of years in many parts of the world.

stewing in Morocco, pickling in Korea) See if students can figure out what the various utensils are used for.

• Cooking interactive: Invite students to prepare four virtual dishes — grilled fish from the United States, poached eggs with hollandaise sauce from France, groundnut soup from Africa, and tamales from the Americas - to learn about the science behind different cooking methods. (e.g. grilling, poaching, sweating, boiling, sautéing, stewing, steaming)



OVERVIEW: The flavor of food depends on a variety of factors, including appearance, smell, and familiarity.

GUIDED EXPLORATIONS:

- Carts & models: The way we sense food is shaped by both biology and experience. Have students explore how their taste buds work, how appearance can affect flavor, how culture influences food choices, and the evolution of food preferences.
- Tasting experiments: Students can participate in taste experiments or watch demonstrations.



OVERVIEW: As the saying goes, "you are what you eat." Meals reflect our histories, social and economic status, and priorities. Issues that include obesity and food scarcity are influencing the way we eat now — and will eat in the future.

GUIDED EXPLORATIONS:

- "Groceries for a Week" photos: Diets vary greatly. Have students examine photos of what families around the world consume over the course of one week. How do these families' diets compare to their own?
- "What Does Food Mean to You?" virtual postcards: Have students explore what food means to other visitors. Ask what image they would choose for their own postcard.
- Dioramas and models of seven iconic meals: These represent meals eaten by notable people in different eras, including Kublai Khan's feast, Jane Austen's dessert, and Michael Phelps' breakfast. Invite students to examine the meals and identify familiar dishes. What do these meals reflect about when and where they were served, and to whom? (e.g. ice cream was a luxury in an era before refrigeration; a meal on-the go for an ancient traveler)
- "Future of Food" exhibit: Invite students to explore what the future holds, from eating algae and insects to the role of biotechnology.



CELEBRATE

OVERVIEW: Food does so much more than keep us alive. It plays a central role in family tradition, cultural heritage, and religious ritual.

GUIDED EXPLORATIONS:

 "Celebrations" theater and objects: Invite students to watch the video and examine objects to explore how food is part of celebrations and rituals around the world, such as China's Autumn Moon Festival and the Day of the Dead in Mexico.



For their harvest festival, Korean families make songpyeon: steamed rice dumplings filled with sweet sesame, bean, or chestnut paste.

Our Global Kitchen Exhibition Website

amnh.org/our-global-kitchen Access videos, photo galleries, related programs, and more.

Global Grocery

amnh.org/ology/features/globalgrocery/ Find out where in the world many of the foods in your kitchen come from. OLogy is the Museum's website for kids.

Science Bulletins

amnh.org/sciencebulletins Videos, essay, and data visualizations about current research.

Monterey Bay Seafood Watch

montereybayaquarium.org/cr/seafoodwatch.aspx Sustainable seafood choices for consumers and businesses.

Healthy School Food

www.healthyschoolfood.org

Nutrition education, information about plant-based foods, and programs for the whole school community from the New York Coalition for Healthy School Food.

Food n' Me

foodnme.com A lively interactive site that educates kids and promotes healthy eating.

NYPL: What's on the Menu?

menus.nypl.org Over 15,000 historical restaurant menus, dating back hundreds of years and searchable dish by dish.

The Kitchen Sisters

kitchensisters.org The "Hidden Kitchens" radio series explores how communities come together through food.

Windowfarms

our.windowfarms.org

Find out why and how to start a farm in your window, and join a global online community of vertical farmers.

Johns Hopkins: Teaching the Food System

jhsph.edu/research/centers-and-institutes/ teaching-the-food-system

A cross-disciplinary approach to studying what's involved in getting food from field to plate. An 11-module curriculum emphasizes the relationships between food, public health, equity, and the environment.

USDA: Choose My Plate

www.choosemyplate.gov

The USDA's building blocks of a healthy diet, with tools and tips to help Americans make good food choices.

Harvard School of Public Health: The Nutrition Source

hsph.harvard.edu/nutritionsource Clear and thorough information about healthy eating, including a Nutrition A-Z, recipes, studies, and news.

Meatless Monday

meatlessmonday.com

Information and recipes to help reduce meat consumption and its toll on the environment. Includes links to other public health initiatives, and activities for kids.

Nourish: Food + Community

nourishlife.org

Resources designed to encourage meaningful conversations about food and sustainability in schools and communities.

Share Your Best Food Memories!

We invite you and your students to take part in the **"What Does Food Mean to You?"** interactive.

Just post your photo on Instagram with hashtag #CelebrateFoodTX. Include **a caption** about what makes this moment special. Your photo may be featured in the exhibition.



CREDITS

Our Global Kitchen: Food, Nature, Culture is organized by the American Museum of Natural History, New York (www.amnh.org)

The exclusive corporate sponsor for *Our Global Kitchen* Education Programs is

Additional support for *Our Global Kitchen* and its related educational and online resources has been provided by



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unications Foundat gracelinks.org

MAP of the Exhibition



OUR GLOBAL KITCHEN Activities for Grades K-2 Where Does Our Food Come From?

OVERVIEW

Students will learn about where food comes from and what is required to grow plants.

- **Before Your Visit:** Students will learn how seeds germinate and plants grow.
- During Your Visit:
 - o In *Our Global Kitchen*, students will use their senses to observe and investigate how food grows, and find out how it reaches our kitchens.
- Back in the Classroom: Students will discuss what they learned at the Museum, observe seedlings growing, and talk about cultural and family traditions.

BACKGROUND FOR EDUCATORS

Most of the plants and animals we raise for food barely resemble their wild ancestors; they have been dramatically changed by humans. Thousands of years ago, for instance, there was no maize (corn). Today's massive cobs were bred from a wild grass.

All plants require water, light, and a growing medium (e.g. soil) in order to thrive.

BEFORE YOUR VISIT

Activity: Where Does Our Food Come From?

Objective: Students will explore familiar foods and food origins. Then the class will plant seeds.

Part 1: Class Discussion

Have students work in pairs to discuss the following:

- What is your favorite food?
- What food do you find gross or disgusting?
- Tell me about a time you were afraid of or didn't want to try a food.
- What foods do you eat but your parents don't eat?
- What foods do your parents eat but you don't eat?

Ask students to share some of their answers with the class. Write them on the board. Then have students look at the list. Ask: Where does this food come from? *(Accept all answers.)* Elicit the fact that most of our food comes from animals and plants.

Ask students for examples of animals and plants that we eat. Write down their ideas and save this information for follow-up after the Museum visit. Keep a separate list of items whose origin is unclear.

Texas Essential Knowledge and Skills Science Standards:

(Organisms and Environment) K.9.B, K.10.B-D, 1.10.B, 2.9.A, 2.10.B

Texas Essential Knowledge and Skills Social Studies Standards: (Geography and Culture) K.12.A-B, 1.1.B, 1.15.A, 2.16.B

Plan how your students will explore the *Our Global Kitchen* exhibition using the group worksheets.

Divide your class into small groups of three to four and assign each to a teacher/parent chaperone who will facilitate their exploration of the dioramas.

If possible, distribute and review copies of the map and worksheets to chaperones beforehand.

Part 2: Growing Seeds

Plant seeds as a class. The easiest way to do this is to purchase a bag of dried black beans and soak them overnight. Once they sprout, you can use the instructions and materials on any of these websites:

- Using soda bottles: http://weirdsciencekids.com/ecosystem.html
- Using cotton balls: http://www.theimaginationtree.com/2012/04/growing-beans-on-cotton-balls.html
- Using baggies: http://www.greeneducationfoundation.org/institute/lesson-clearinghouse/294-how-to-grow-beans-in-a-plastic-bag.html

Additional Information

• Bottle Gardens: http://www.bottlebiology.org/index.html

Tell students that at the Museum, they will see lots of pictures and models of foods from all kinds of plants and animals. They will use their senses to observe and describe the foods.

DURING YOUR VISIT

Our Global Kitchen: Food, Nature, Culture

1st floor, Herzstein Hall

Guided by chaperones, students will use their senses to make observations about the appearance, flavor, ingredients, and origins of different foods. Ask the chaperones to write down all the types of foods the students observe on the group worksheets.

BACK IN THE CLASSROOM

Activity: What Do Seeds Needs to Grow?

Students will discuss what they learned at the Museum and observe the plants they're growing.

Discuss the following with students:

- Look at your seeds. What do seeds need to grow? (Answer: Plants require air, water, nutrients, and light in order to live and thrive.)
- What is stored in a seed that helps it grow? (Answer: Seeds contain stored food that aids in germination and the growth of young plants.)
- Think about all the plants that you saw at the Museum. Which ones would you like to grow?

Over the next few weeks, have students observe the seeds they planted before the Museum visit. Have them measure and draw the seedlings as they grow.

Activity: Culture and Family Traditions

Have students share their ideas about cultural and family traditions. Use the following questions as prompts:

- Can you name a food that your family eats but your friends don't?
- If you could choose the meals for a day, what would your menu be?
- · What food does your family eat on holidays?
- Can you think of a food that your grandmother or grandfather makes, and that they learned from their parents?
- Have you ever travelled to a new place and eaten something for the first time?
- Tell us about a time something you ate surprised you.
- Can you remember a time you were afraid to try a food? Have you tried it since then?
- Tell us about a time when you spat something out.

OUR GLOBAL KITCHEN Group Worksheet

Grades K-2

Instructions for the adult facilitator:

- 1. As you go through the exhibition, invite students to use their senses to learn more about the plants and animals that we eat.
- 2. Encourage contributions from all students.
- 3. Record as many of their observations as possible.

Location	Ask Students	Record Their Responses
Grow section	Look: Which foods come from plants?	
Grow section	Look: Which foods come from animals?	
Trade section: Aztec market- place diorama	Look: What foods are made from plants?	
Trade section: Aztec market- place diorama	Sight: What foods are made from animals?	
Cook section	Smell: What did you smell? Are these plant or animal smells?	
Cook section	Taste: How are our sense of taste and smell connected?	
Eat section: Kenyan Comfort Food meal	What dishes are made from animals? From plants?	
Eat section: Power Meal (Michael Phelps breakfast)	What dishes are made from animals? From plants?	
Eat section: Choose a meal	What dishes are made from animals? From plants?	

our global kitchen Group Worksheet

Instructions for the adult facilitator:

- ANSWER KEY
- 1. As you go through the exhibition, invite students to use their senses to learn more about the plants and animals that we eat.
- 2. Encourage contributions from all students.
- 3. Record as many of their observations as possible.

Location	Ask Students	Record Their Responses
Grow section	Look: Which foods come from plants?	(Answers may include: corn, cassava, potatoes, crab apples, watermelon, cabbage, peppers, rice, beans)
Grow section	Look: Which foods come from animals?	(Answers may include: fish, cows, test tube beef, oysters, pigs, chicken)
Trade section: Aztec market- place diorama	Look: What foods are made from plants?	(Answers may include: squash, pumpkin, chiles, tomato, cacao beans, vanilla, peppers, corn, prickly pear cactus, chayote, squash blossoms, maguey heads)
Trade section: Aztec market- place diorama	Sight: What foods are made from animals?	(Answers may include: insects, lizards, turkey, grasshoppers, maguey worms, fish)
Cook section	Smell: What did you smell? Are these plant or animal smells?	(Answers may include: lemon, lavender, thyme, fennel)
Cook section	Taste: How are our sense of taste and smell connected?	(Answers will vary. Your sense of smell helps you taste food.)
Eat section: Kenyan Comfort Food meal	What dishes are made from animals? From plants?	(Answers may include: from animals: chicken; from plants: grains, vegetables, tea)
Eat section: Power Meal (Michael Phelps breakfast)	What dishes are made from animals? From plants?	(Answers may include: from animals: cheese, eggs, cream, butter, milk; from plants, bread, strawberries, berries, maple syrup, lettuce, tomato, coffee)
Eat section: Choose a meal	What dishes are made from animals? From plants?	(Answers will vary.)

OVERVIEW

Students will explore the role that food plays in both their own lives and in other cultures.

- **Before Your Visit:** Students will write about and share a food-related item that's important to their own families.
- During Your Visit:
 - o In *Our Global Kitchen*, students will explore the role of food worldwide, and reflect on how it resembles or differs from their own experience.
- **Back in the Classroom:** Students will investigate how the food traditions in their family have changed over time by interviewing an older relative. Using materials from these activities and recipes from home, students will then collaborate on a class cookbook.

BACKGROUND FOR EDUCATORS

What we call "culture" is everything that makes up the way a group of people live, including how they eat, celebrate, and worship. Food is a core element of cultural identity — bringing families together for daily meals as well as communities together for rituals and celebrations. By investigating food's place in their lives, students can enrich their understanding of their own culture. In exploring their family's food history, students can experience the dynamic nature of culture over time. Finally, by studying global food traditions, students can broaden their knowledge of other cultures.

BEFORE YOUR VISIT

Activity: Looking at Our Own Food Traditions

Objective: Students will bring a food-related object to class and share its significance.

- 1. A few days to a week before the lesson, instruct students to bring in an object, photo, or drawing that relates to food. The item should relate to their family, neighborhood, beliefs, or traditions. Examples include a photo of a family meal, a drawing of a dish or ingredient, a food sample (nonperishable), a tool used to prepare food, or a recipe. Stress that items should not be valuable or fragile.
- 2. Have students describe their food item using the "Our Food Traditions" worksheet. Encourage them to include as much detail as possible.
- 3. Divide the class into small groups of three to five. Have students take turns presenting their items to each other, using the questions on the worksheet to guide their discussions.

Texas Essential Knowledge and Skills Social Studies Standards:

(Geography and Culture) 3.13.A-B, 4.19.A-C, 5.22.B-C

Plan how your students will explore the *Our Global Kitchen* exhibition using the student worksheets.

Distribute the worksheets to the students. You may want to review the worksheets and the map of the exhibition with them to make sure they understand what they are to do.

Note that the worksheets focus the students' attention on the Grow, Transport, Cook, and Eat sections. Students should also explore the Celebrate and Taste sections.

Wrap Up: Conduct a whole-class discussion about the similarities and differences among the items. Record their observations on the board in a T chart format.

amnh.org/our-global-kitchen

Activities for Grades 3-5

Activity: Prepare for Museum Visit

Distribute the student worksheets and read them together as a class. Tell students that the exhibition is broken up into six sections — Grow, Transport, Cook, Eat, Taste, and Celebrate — and that they will be completing a section of the worksheet for the first four.

DURING YOUR VISIT

Our Global Kitchen: Food, Nature, Culture

1st floor, Herzstein Hall

Students will use the worksheets to guide them in exploring the exhibition. Upon entering, walk past the videos on round screens to the theater and have students sit on the fruit and vegetable seats to watch the introductory video. Then, individually, in pairs, or in small groups, have students explore the exhibition, filling in their worksheets as they go. In the Celebrate section at the end, have the group sit and watch the short video.

BACK IN THE CLASSROOM

Activity: Class Discussion of Museum Visit

As a class, have students share the most interesting things they learned in the exhibition. Go through the sections and have students share the answers they found, and the items they chose to sketch. Where applicable, ask how those items relate to their own lives and food traditions.

Activity: Changing Family Food Traditions

Objective: Students will investigate how the food traditions in their family have changed over time by interviewing an older family member.

- 1. Have students choose a tradition in their family that involves food (e.g. a favorite dish or holiday meal) and fill out the first part of the "Our Changing Food Traditions" worksheet.
- 2. Ask students to choose a family member who is *at least* 20 years older than them (e.g. a parent, grandparent, aunt/uncle) to interview. The interview can be conducted in person or over the phone. Tell students they'll be discussing the tradition they chose above and what it was like when the relative was the same age the student is now. (For example, if an eight-year-old student chooses Thanksgiving dinner and interviews a grandparent, the interview should focus on how the grandparent celebrated Thanksgiving at age eight.) Have students ask the questions in the second part of the "Our Changing Food Traditions" worksheet and write down the answers.
- 3. Afterwards, have students write one to two paragraphs about how their family traditions have changed since their relatives' childhoods and which aspects have remained the same.
- 4. Have students rejoin their groups and take turns presenting their findings, using their written work to guide them. Encourage them to talk about any differences and similarities they discovered.

Wrap Up: After all students have presented, conduct a whole-class discussion about how family traditions change, noting any recurring themes on the board.

Activity: Create a Class Cookbook

Objective: Students will use materials from the activities and recipes from home to collaborate on a class cookbook.

- 1. Have students bring in recipes from home (ideally related to either the item they brought in or the interview they conducted).
- 2. Have students decide how to group the recipes and which other text, photos, and drawings from previous activities to include. Be sure to include your own favorite recipes and memories of your family food traditions!

Your class can also take part in the "What Does Food Mean to You?" interactive featured in the Cook section of the exhibition. Post food-related photos on Instagram with hashtag #CelebrateFoodTX. Your photo may be featured in the exhibition. Include a caption about what makes this moment special.

Our Food Traditions

What is your food item?

Why did you choose it?

What is its significance in your family?

What makes it important in your culture?

our global kitchen Student Worksheet

Use the questions below to explore four sections of the exhibition. Record your observations.

1. GROW Look at all the foods represented on the walls. Which of these foods would you be the most likely to share with your family?	Sketch the food that you'd most likely share with your family.
2. TRADE Look at the large scene of a marketplace. What place does this scene represent?	Sketch one of the items that seem impor- tant to the people.
When is it taking place? Which products in this scene seem important to the people of the time? (Use clues you see and information from text panels.)	

3. COOK

Look at the food preparation and serving tools in this area. Choose one item that you find interesting.

What is it called?

How is it used?

Where does it come from?

Do you have something like this in your house?

If not, do you have anything that serves the same purpose?

Sketch the item.				

4. COOK

Look at the meals represented in both the large scenes around the room and the smaller meals in the center. Choose the meal that you think is the most interesting.

Who's eating this meal?

What meal or part of the meal is depicted (for example, breakfast, dinner, dessert)?

In what time period is this meal being served?

Which food items do you recognize?

Which food items are unfamiliar?

Why did you choose this meal?

Sketch the meal.		

What is your relation to the person you're interviewing (for example, parent, grandparent, aunt or uncle, old family friend)?

Why did you choose this person to interview?

OUR GLOBAL KITCHEN Post-Visit Worksheet

Our Changing Food Traditions

Part 1: Fill in the following information before you begin your interview.

Your name:

Your age:

What family tradition have you chosen?

When does your family practice this tradition?

What food or foods do you associate with this tradition?

Why did you choose this tradition?

OUR GLOBAL KITCHEN

Part 2: Ask your family member following questions, and write down this or her responses.

Name: _____ In what year were you my age? _____

When you were my age, describe how you celebrated [fill in tradition you chose]

What food or foods were served?

Were they always the same?

Why were those particular foods important serve every time?

How has this tradition changed since you were my age?

Why do you think it changed?

How has this tradition remained the same?

our global kitchen Student Worksheet

Grades 3-5

Use the questions below to explore four sections of the exhibition. Record your observations.

1. GROW

Look at all the foods represented on the walls.

Which of these foods would you be the most likely to share with your family?



Sketch the food that you'd most likely share with your family.

2. TRADE	Sketch one of the items that seem impor-	
Look at the large scene of a marketplace. What place does this scene represent? <i>(Answer: Tenochtitlan, capitol of the Aztec Empire)</i>	tant to the people.	
When is it taking place? (Answer: 1519)		
Which products in this scene seem important to the people of the time? (Use clues you see and information from text panels.)		

3. COOK

Look at the food preparation and serving tools in this area. Choose one item that you find interesting.

What is it called?

How is it used?

Where does it come from?

Do you have something like this in your house?

If not, do you have anything that serves the same purpose?

Sketch the item.				

OUR GLOBAL KITCHEN Investigate How Food is Produced, Distributed, Exchanged, and Consumed

Students will investigate the way food is produced, distributed, exchanged, and consumed.

• **Before Your Visit:** Students will explore a computer interactive and consider how far their groceries have traveled.

• During Your Visit:

- o As they move through *Our Global Kitchen*, students will explore food production, distribution, exchange, and consumption.
- o In the Windowfarms display, students will discuss the advantages and disadvantages of local, small scale food production and its role in feeding a growing world population.
- **Back in the Classroom:** Students will explore a case study of the supply chain for apples by filling out a diagram based on prior knowledge and then engage in an associated reading that will help them further understand food production, distribution, exchange, and consumption.

BACKGROUND FOR EDUCATORS

The foods that we choose connect us to farms and farmers, and our choices support systems of gathering, growing, processing, and storing — all of which affect the planet. Food may come from our backyard, a regional farm, or from thousands of miles away, so our choices also affect transportation networks and energy consumption.

BEFORE YOUR VISIT

Activity: Global Grocery

amnh.org/ology/features/globalgrocery/

Have students select one item from the Global Grocery interactive and think about how it got to their table. Ask them to consider the following questions:

- What's the key ingredient in the food you chose?
- How and where do you think it grows?
- How was it processed to make the food you selected?
- What other ingredients had to be added, if any?
- How did that food travel to your table?
- What was exchanged for the food?

DURING YOUR VISIT

Our Global Kitchen: Food, Nature, Culture

1st floor, Herzstein Hall

Students will use the worksheet to explore the exhibition, with a focus on food production, distribution, exchange, and consumption.

Texas Essential Knowledge and Skills Standards:

Economics, Science, Technology and Society 6.9.A, 6.10.A, 8.27.B-C

Plan how your students will explore the *Our Global Kitchen* exhibition using the student worksheets.

Distribute the worksheets to the students. You may want to review the worksheets and the map of the exhibition with them to make sure they understand what they are to do.

Activities for Grades 6-8

BACK IN THE CLASSROOM

Activity: Food Supply Chain: Washington Apple Case Study

Objective: Students will complete a food chain supply diagram to learn how apples are produced and distributed.

- Print out the following and distribute a copy for each group: Food Supply Chain: Washington Apple Handout http://www.jhsph.edu/research/centers-and-institutes/teaching-the-food-system/ curriculum/_pdf/Ingredients_of_the_Food_System-Handouts.pdf
- 2. Have students break into groups of four. Each member of the team should select an aspect to focus on (Production, Distribution, Exchange, or Consumption). Working as a team, have students fill in the information they think is missing to create an overall picture of the apple supply chain.

Note: The students focusing on consumption should think of the various ways in which apples are processed for consumption.

- 3. Afterwards have each group post its chart on the board.
- 4. Then have students read the article about apples (included at the end of the PDF) and have a class discussion about the food chains that they created. What new information, if any, did students get from the reading?

Note: You can bring in the three types of apples to help illustrate the reading.

our global kitchen Student Worksheet

Production

1. In the **Grow section**, find and explore the **"Reshaping Our Foods"** wall. Choose two products featured and explain how and why they have been modified.

2. In the same section, visit **"Ways of Growing"** and explore the **six mini dioramas** that show different farming methods. Choose one, explain what it shows and where it's being used, and think of one pro and one con of this type of growing.

Distribution and Exchange

3. In the Trade section, visit the Aztec Market diorama. What foods can you recognize?

How do you think that these foods reached the market?

What could be exchanged for goods?

4. In the same section, find and explore the **Food Waste display**. Name one way in which food is wasted during distribution or exchange.

5. Explore the **Cook section**. Name three ways that food can be preserved so that it can be eaten later or transported.

Consumption

6. In the **Eat section**, choose one of the three **dioramas** (Livia Drusilla, Jane Austin, or Kublai Khan). What do these meals tell us about the people who ate them? How far did the ingredients travel?

our global kitchen Student Worksheet



1. In the **Grow section**, find and explore the **"Reshaping Our Foods"** wall. Choose two products featured and explain how and why they have been modified.

(Answers may include:

Production

- Yield: Casava can grow in many conditions and can feed more people than grains like rice or wheat. Chickens have been bred to produce more eggs. "Miracle Rice" was developed to produce higher yields.
- Size and Shape: Tomatoes have been bred to be bigger and are picked green to make them easier to transport. Strawberries and watermelons have been bred to be bigger. Due to overfishing, smaller, younger cod have replaced larger ones.
- Location: Potatoes have been bred so that they can be grown in many locations.
- Taste: Chiles have been bred for spiciness. Apples have been bred for sweetness.)
- 2. In the same section, visit **"Ways of Growing"** and explore the **six mini dioramas** that show different farming methods. Choose one, explain what it shows and where it's being used, and think of one pro and one con of this type of growing.

(Answers will vary but may include: subsistence rice farming in Vietnam, oyster farming (aquaculture) in France, push-pull maize or diversified farming in Kenya, urban agriculture in Brazil, large-scale industrial farming in the U.S., corn farming in Iowa.)

Distribution and Exchange

3. In the Trade section, visit the Aztec Market diorama. What foods can you recognize?

(Answers will vary.)

How do you think that these foods reached the market?

(Answers will vary.)

What could be exchanged for goods?

(Answers will include: cacao beans, which served as currency; other goods produced by the farmers.)

4. In the same section, find and explore the **Food Waste display**. Name one way in which food is wasted during distribution or exchange.

(Answers will include: damaged food is discarded, storage is inadequate, not enough machinery to process and package, problems with transportation to market)

OUR GLOBAL KITCHEN

ANSWER KEY

5. Explore the **Cook section**. Name three ways that food can be preserved so that it can be eaten later or transported.

(Answers will include: Sugar, salt, smoking, canning, pickling, drying)

Consumption

6. In the **Eat section**, choose one of the three **dioramas** (Livia Drusilla, Jane Austin, or Kublai Khan). What do these meals tell us about the people who ate them? How far did the ingredients travel?

(Answers will vary.)



OUR GLOBAL KITCHEN Reading: Apples

The New York State apple harvest begins in August, providing local apples to grocery stores, farmers' markets and "food hubs" that distribute produce from several small farms to larger markets. Alongside regional specialties like the McIntosh and Empire varieties, New York State orchards also grow the popular Red Delicious, Gala, and Fuji apples.

New York State grows a lot of apples, but processes half of those apples into juice, sauce or cider. To fill the demand for fresh apples, stores mix local New York apples with imports. Sometimes the convenience of dealing with large organizations leads grocers to buy out-of-state apples. Depending on the time of year and the variety, fresh apples in New York stores can come from as far away as Chile or New Zealand.

Washington State's climate and efficient orchard industry have made it America's largest apple producer. Apples can be stored for up to 240 days without spoiling if they are stored under special conditions, including very low levels of oxygen. In the winter the New York harvest is finished and the foreign harvest season may be months away. To ensure that apples are available all year round, Washington State has built giant controlled-atmosphere warehouses.

Washington also has a great transportation network. Highways cut through the state's three major growing regions, providing easy access for refrigerated trucks. Washington apples are shipped around the U.S. by truck and rail, with each refrigerated truck or railcar carrying hundreds, sometimes thousands, of boxes of fruit. Apples bound for the Northeast market travel by train. Competitive costs, assistance with marketing, and large distributors make it possible for Washington apples to compete with New York apples all year round. The scale of Washington's apple industry enables it to dominate the market, and it provides most of the apples sold in New York groceries during the winter.

In the spring and summer New York also imports apples from countries in the Southern hemisphere. Chile is by far the largest foreign supplier of apples to the U.S., and exports more Gala apples than any other variety. The fruit travels in special refrigerated shipping containers that prevent it from ripening. In recent years, China has become a major player in the world apple market, and over 60 percent of the apples grown there are Fujis. Although New York State orchards produce Fuji apples, at least some Washington State Fuji apples end up in New York stores. However, those Fujis may soon come from even farther away.

Foreign imports peak in July, but fall off dramatically in August as New York begins its own apple harvest.

OUR GLOBAL KITCHEN

Activities for Grades 9–12

Our Food: Where Does it Come From? Where is it Going?

OVERVIEW

Students will learn how food is traded and transported all over the world, and assess the advantages and disadvantages of this global economic network. Drawing on assigned readings and information presented in the *Our Global Kitchen* exhibition, students will explore the economic, cultural, and environmental impacts of the food trade, and offer potential solutions.

• **Before Your Visit:** Students will brainstorm about the original needs to which the current global food trade developed in response,

and discuss the advantages and disadvantages of transporting food over long distances. This brainstorming session will be followed by reading an assignment about food distribution and transport.

- During Your Visit:
 - o In *Our Global Kitchen*, students will focus on the Trade section, where they will gather evidence of the economic and cultural impacts of the food trade, both positive and negative.
- **Back in the Classroom:** Students will write a short essay comparing the advantages and disadvantages of trading and transporting foods over long distances.

BACKGROUND FOR EDUCATORS

Since the beginning of agriculture, food has frequently been consumed far from the farm. It travels across a complicated network with consequences for producers, distributers, consumers, and the plant and animal species being traded, as well as for the environment.

BEFORE YOUR VISIT

Activity: Trade and Transportation

Objective: Students will explore the need for trading and transporting food over long distances and reflect why the need arose. They will consider some of the problems created by current practices, as well as possible solutions.

Plan how your students will explore the *Our Global Kitchen* exhibition using the student worksheets.

Distribute the worksheets to the students. You may want to review the worksheets and the map of the exhibition with them to make sure they understand what they are to do.

1. Divide students into groups of four or five. Have each group discuss why they think humans started transporting food, and write down four. Then have each group brainstorm the advantages and disadvantages of transporting food over long distances and list four of each.

This can be opened up for class discussion and a comprehensive list can be written on the board.

2. Have students read "Food Distribution and Transport" (included at end of PDF) from the Johns Hopkins Center for a Livable Future. Students can stay in groups but each student should read this article independently.

amnh.org/our-global-kitchen

Texas Essential Knowledge and Skills Standards:

High School Economics 1.C-D, 3.B, 4.A World History 6.B, 7.B, 17 World Geography 10.A,C-D, 11.B-C, 12.A Ask each group to answer the following questions:

- Why is transporting food necessary today? (Answers may include: to feed densely populated areas that could not acquire enough food locally; to provide consumers with greater variety; to capitalize on the productivity of certain agricultural areas)
- What conditions allow some crops to be grown and or animals to be raised in specific locations? (Answers may include: climate; topography; soil; political and economic conditions)
- What are some of the unintended consequences of food distribution and transport? Why do they come about? (Answers may include: small local producers cannot compete with large-scale producers and global distribution networks; transporting food over far distances contributes to climate change by burning fossil fuels)
- Revisit the list of advantages and disadvantages brainstormed by each group earlier. Add to this list as a class. *(Answers will vary.)*

DURING YOUR VISIT

Our Global Kitchen: Food, Nature, Culture

1st floor, Herzstein Hall

Students will visit the Grow section of the exhibition and observe how humans have created countless varieties of crops and livestock adapted to local conditions and grow food in a multitude of ways. Next, students will visit the Trade section and continue to gather evidence of the economic, cultural, and environmental impacts of trading and transporting food.

BACK IN THE CLASSROOM

Activity: Tying it All Together

Objective: Students will synthesize the information they've gathered from background reading (see links) and the Museum exhibition for a short essay about global food distribution.

Have students reassemble into the same small groups. Using information synthesized from the background reading and gathered in the exhibition, have them analyze the food trade. Essays should include a case study from the Aztec market. Have students choose a food from the market that is culturally important in another part of the world today (e.g. tomatoes in Italy, chocolate in Switzerland, chili in Asia). Have them research where and when this food was originally domesticated and how and when it has been traded globally.

The essays should incorporate an in-depth examination of the strengths and limitations of current practices for transporting and distributing food, as well as recommendations for the future.

Background Readings

- amnh.org/ourglobalkitchen/more
- nature.com/nature/journal/v418/n6898/pdf/nature01019.pdf
- ers.usda.gov/
- nrdc.org/food/wasted-food.asp
- Cambridge encyclopedia of food

OUR GLOBAL KITCHEN

Grades 9-12

Student Worksheet: Where Does Our Food Come From? Where Is It Going?

Today you will observe how humans have created countless varieties of crops and livestock adapted to local conditions and raise food in a multitude of ways, and gather evidence of the economic, cultural, and environmental impacts of trading and transporting food.

GROW SECTION 1. Agriculture mini-dioramas, vertical gardens, & "Future of Growing" cases

All plants require water, light, and a growing medium (e.g. soil) in order to thrive.

Compare and contrast farming methods. What techniques help people farm successfully around the world? What are some challenges they face?

How are farmers addressing these challenges?

TRADE SECTION 2. "Modern Markets" map & trade interactive

Food might come from your garden — or from the other side of the world. Explore how and why foods move around the world.

What are some commodities that countries trade?

What are the five most common foods imported and exported worldwide?

Which countries are the top importers and exporters of each food? Use the chart.

What might be an economic impact (advantage or disadvantage) of the modern system of importing and exporting these products worldwide?

Food	Top Importer	Top Exporter

3. Food Ships Kiosks

Choose two foods from the interactive and track their trade. What might be an advantage and a disadvantage of each particular method of transport?

Name of Crop	Origins	Destinations	Advantage	Disadvantage

4. Food Waste

Examine the graphs and information on this wall panel. Where along this pipeline is most food wasted by high and middle-income countries?

Where along this pipeline is most food wasted by low-income countries?

What are the economic and environmental impacts of wasting food at any point along the pipeline?

5. Aztec Marketplace Diorama

Food and other items were carried to this capital city from all over the thriving Aztec Empire (now Mexico).

Name some foods that are for sale.

What common foods are missing? Why?

Find chocolate in different forms in the marketplace. How did the Aztecs use it?

List other countries or cultures that are commonly associated with foods found in the Aztec marketplace today.

6. Too Little, Too Much

Look for this wall panel beyond the kitchen in the exhibition. If our food is traded widely and globally, why is one out of eight people around the world hungry? What are the cultural implications of this?

OUR GLOBAL KITCHEN

. . . .

Grades 9-12

Student Worksheet: Where Does Our Food Come From? Where Is It Going?

Today you will observe how humans have created countless varieties of crops and livestock adapted to local conditions and raise food in a multitude of ways,

and gather evidence of the economic, cultural, and environmental impacts of trading and transporting food.

GROW SECTION 1. Agriculture mini-dioramas, vertical gardens, & "Future of Growing" cases

All plants require water, light, and a growing medium (e.g. soil) in order to thrive.

Compare and contrast farming methods. What techniques help people farm successfully around the world? What are some challenges they face?

(Answers may include: large-scale farming produces high yields at relatively low prices; uses chemicals and a great deal of water; depletes the soil)

How are farmers addressing these challenges?

(Answers may include: in densely populated urban areas farmers use rooftop garden beds, vertical gardens, and hydroponic technology)

TRADE SECTION

2. "Modern Markets" map & trade interactive

Food might come from your garden — or from the other side of the world. Explore how and why foods move around the world.

What are some commodities that countries trade? (Answers may include: spices, animals, processed foods, fuel)

What are the five most common foods imported and exported worldwide? (Answers may include: bananas, maize, soy beans, wheat, beer)

Which countries are the top importers and exporters of each food? Use the chart.

Food	Top Importer	Top Exporter
A: Banana	A: USA	A: n/a
A: Maize	A: Japan	A: USA
A: Soy beans	A: China	A: Brazil
A: Wheat	A: Germany	A: France
A: Beer	A: n/a	A: Netherlands

What might be an economic impact (advantage or disadvantage) of the modern system of importing and exporting these products worldwide?

(Answers may include: Advantage: Trade helps the economies of countries exporting foods worldwide; it means there is a demand for products they produce. Disadvantage: Long-distance transport is not good for the environment because of fossil fuel emissions; If the world is depending on only 4 or 5 main crops, we may be at risk of depleting them.)



rve how humans have created countless varieties of crop

3. Food Ships Kiosks

ANSWER KEY

Choose two foods from the interactive and track their trade. What might be an advantage and a disadvantage of particular method of transport?

Name of Crop	Origins	Destinations	Advantage	Disadvantage
A: Banana	A: Central and South America	A: Japan, Russia	A: ripening can be delayed by picking green bananas, which have an extended life for long trips; shipping without a bag saves money	A: chilling bananas for long trips can cause damage to fruit; shipping without a bag causes the bananas to ripen faster
A: Lamb	A: New Zealand	A: Europe, Japan, North America	A: shipping after processing is good for preservation if meat is kept chilled or frozen; frozen meat sells for less money than chilled meat, but also costs less to ship	A: shipping chilled meat is a trade off between retail price and shipping cost; exporting chilled meat is hard and expensive to preserve for long trips, but consumers pay more as well

4. Food Waste

Examine the graphs and information on this wall panel. Where along this pipeline is most food wasted by high and middle-income countries?

(Answer: consumption)

Where along this pipeline is most food wasted by low-income countries? *(Answer: post-harvest handling)*

What are the economic and environmental impacts of wasting food at any point along the pipeline? (Answer: More than 30% of food (or 1.43 billion tons) never gets eaten. Economically, this is a waste of money spent to grow, harvest, and ship food. Environmentally, this is a waste of fertile land used to grow the food as well as unnecessary carbon emissions released into the environment from transporting food over long distances.)

5. Aztec Marketplace Diorama

Food and other items were carried to this capital city from all over the thriving Aztec Empire (now Mexico).

Name some foods that are for sale. (Answers may include: peppers, tomatoes, corn)

What common foods are missing? Why?

(Answers may include: bread, cheese, chicken; they weren't produced locally and had yet to reach the region via trade)

Find chocolate in different forms in the marketplace. How did the Aztecs use it? (*Answers may include: as a beverage, currency, tribute to conquerors, offerings to gods*)

List other countries or cultures that are commonly associated with foods found in the Aztec marketplace today. *(Answers may include: Italy and tomatoes; Switzerland and chocolate)*

6. Too Little, Too Much

Look for this wall panel beyond the kitchen in the exhibition. If our food is traded widely and globally, why is one out of eight people around the world hungry? What are the cultural implications of this?