



Exploring Origins: Where Our Food Comes From



NOURISH SMART



Hunger Solutions Institute
UtahStateUniversity.

Course Standards

Standard ENVS.4.1

Construct an argument to evaluate how human population growth affects natural resources and the potential solutions to these effects. Examples of resources affected by human population growth could include food demand, food supply, waste disposal, or land use. Examples of potential solutions could include genetically modified organisms, hydroponics, wastewater treatment, or improved recycling systems.

WHAT IS AGRICULTURE?



Facilitate a discussion with the class by asking what they think the definition of "agriculture" is.



AGRICULTURE

**“THE PRACTICE OF FARMING,
INCLUDING GROWING CROPS
AND REARING ANIMALS.”**

Ask the class to name a few different agricultural practices they know of or have seen. What have they seen grown or raised and where?

COMMERCIAL FARMING

"Farming that focuses on producing agricultural products for sale in the market rather than solely for personal purposes."



Definition: "Farming that focuses on producing agricultural products for sale in the market rather than solely for personal purposes." The farmer's main goal is to make a profit.

Commercial farms make more than \$350,000 in gross profits each year in order to be labeled as a "commercial farm" by the USDA.

Main crops grown in commercial farming include wheat, barley, and corn.

"USDA Agricultural Resource Management Survey data for 2022 indicate that 11.9 percent of U.S. farms are commercial."

-usda.gov

36.1 percent are intermediate farms; meaning they make less than \$350,000 in gross profits each year and the remaining 52.0 percent are residential farms where the operator's primary occupation isn't farming.

-usda.gov

SUBSISTENCE FARMING

“Crops or livestock raised are used to maintain the farmer and the farmer's family, leaving little, if any, surplus for sale or trade.”



"A form of farming in which nearly all of the crops or livestock raised are used to maintain the farmer and the farmer's family, leaving little, if any, surplus for sale or trade."

Most commonly exists within Sub-Saharan Africa, Southeast Asia, and parts of South and Central America today and is a common form of farming in most developing countries.

Ask the class which foods they think are typically produced in these countries that practice subsistence farming.

Main staples are: rice, maize, wheat, and cassava. These staples provide energy, are easy to grow in the climates of the countries above, and are filling.



TERRACE FARMING

"The process of cultivating crops on the sides of hills or mountains by planting on graduated terraces carved into the slope, or in other words, the practice of carving flat regions out of hilly or mountainous terrain to produce crops."

Definition: "the process of cultivating crops on the sides of hills or mountains by planting on graduated terraces carved into the slope, or in other words, the practice of carving flat regions out of hilly or mountainous terrain to produce crops."

Facilitate a discussion with the class by asking why they think terrace farming might be more effective than simply planting on hills.

This type of farming is more effective than simply planting on hills because it reduces soil erosion and allows the water to seep through the soil slowly with less run-off.

Widely used in wheat, rice and barley cultivation. This form of farming is common in east, south, southwest, and southeast Asia, as well as the Mediterranean Basin, Africa, and South America.



APICULTURE (BEEKEEPING)

Definition: "Apiculture is the scientific method of rearing honeybees."

"The number of colonies in the United States on April 1, 2022, was 2.92 million colonies."
-U.S. Honey Industry Report

US bee populations are declining due to several factors:

- Parasites
- Pesticides
- Habitat loss (expansion of infrastructure, ecological changes due to this and climate change, etc.)
- Disease (i.e. In spring 2022, more than 40% of all colonies were afflicted with varroa mites, a parasite that targets bees.) (usafacts.org)
- Nutrition deficit
- Global warming
- Other factors

"A Cornell University Study determined that 14 billion dollars worth of seeds in crops in the United States is pollinated by bees."

Vegetable and fruit crops are affected by bee colony decline.

For example, because of the long frost last year in Logan, Utah many of the fruit trees flowered later than normal. The bee population came before most of the flowering occurred so fruit

production was limited because of reduced pollination.

AQUACULTURE



"Breeding, raising, and harvesting fish, shellfish, and aquatic plants."

Definition: "breeding, raising, and harvesting fish, shellfish, and aquatic plants."
-oceanservice.noaa.gov

Aquaculture farming occurs mostly in the Southern US with catfish and other freshwater fish being bred in high amounts.

About \$850 million dollars come from aquaculture sales in the US each year.

Benefits:

- Reduces occurrence of overfishing
- Can couple with hydroponic plant growth to create a sustainable system

Disadvantages:

- Can lead to invasive species that damage ecosystems
- If farmed fish escape, can lead to a damaged gene pool of natural fish species
- Some aquaculture practices can lead to mutations in the fish because of cramped quarters and higher risk of disease spread (common in farmed salmon)



Which countries does our food come from?

In-Class Activity Idea:

Food Commodity Matching Game

Write down the names of each country on a large white board in the front of the class.

Country names include:

- U.S.
- Canada
- Brazil
- India
- China
- Russia

1. Divide the class into two to four groups depending on how many people are present.
2. Project the commodities (food) list up that is on the next slide when everyone is ready and the rules have been explained.
3. Provide each group with a white piece of paper and have the students list the countries projected on the board. Instruct students to match each country with the correct commodities. The first team that can correctly match each country and commodity wins.
4. Each group gets 2 hints if students are having a hard time matching the correct commodities to their country of origin (the answer key can be found on slide 11).

Oats

Sugar Beets

Cow Milk

Corn

Green Beans

Chicken

Pork

Potatoes

Beef

Rice

Apples

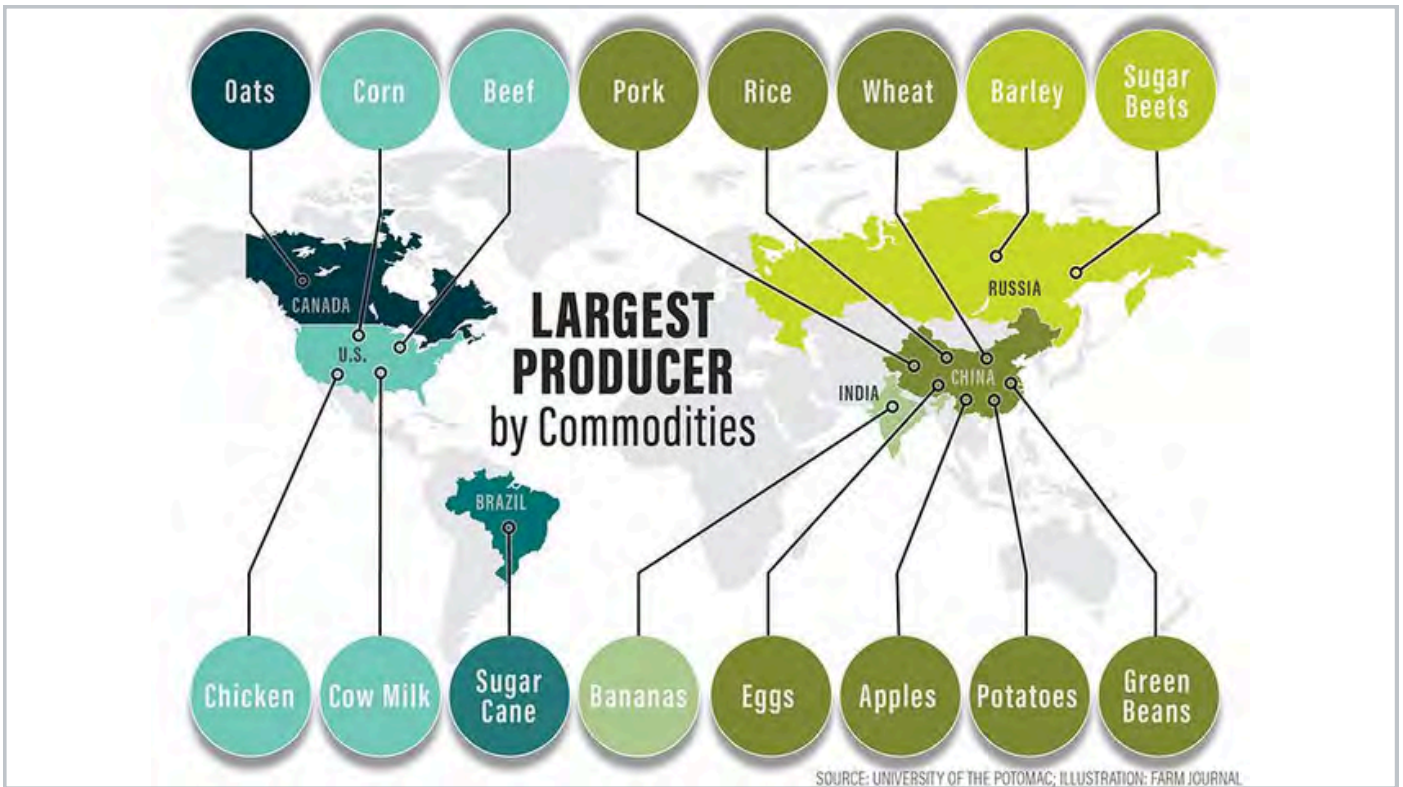
Eggs

Wheat

Bananas

Sugar Cane

Barley



The U.S. is the largest producer for corn, beef, chicken, and cow milk around the world.

Global trading makes it economically possible for multiple countries around the world to buy and sell a variety of foods. Without global trading, we would have to solely rely on farming practices that our region can tolerate to stock our grocery stores with food.

What are Natural Resources?



Ask the class what their thoughts are on what natural resources are. Can they name a few?



Natural Resources

Resources that are drawn from nature and used with few modifications.



All of the following are considered natural resources:

Coal, oil, natural gas, metals, stone, sand, plants and animals, air, sunlight, soil and water.

All of these resources play some part in the process of bringing food from the soil to your table.

Materials like plastic or brass are man-made and are not considered natural resources.



GUESS THE FOOD SYSTEM PATHWAY

In-Class Activity Idea:

Guess the Food System Pathway

1. Instruct students to place the processes of food systems images in the correct order by placing a number (1-6) next to each photo found on the following page.
2. "1" is the first step in the process.
3. This can be a discussion as a class or you can divide into the same groups as the previous commodity activity and see which groups can get the correct answers.

ORDER THE FOOD SYSTEM PROCESSES FROM START TO FINISH



DISTRIBUTION

transport, storage,
wholesale



CONSUMPTION

at school, at work,
at home, on the go



RETAIL

shops, markets,
restaurants, cafes,
canteens



RESOURCE RECOVERY

composting, recycling,
landfill



PROCESSING

manufacturing,
value adding



PRODUCTION

agriculture, community
& backyard gardens

Correct Order:

1. Production
2. Processing
3. Distribution
4. Retail
5. Consumption
6. Resource Recovery

PRODUCTION

RAW MATERIALS

FOOD PRODUCT



Definition: "The process of turning raw materials into an edible food product."

Example: turning soil, water, air, sunlight, and seeds into a tomato.

Production of plants specifically needs a variety of factors in order to produce a desired food product. For example, not only are seeds and soil needed, but bugs, worms, and microorganisms (such as bacteria and fungi) are needed in order to break down the soil and allow for chemical processes to occur in order for the plant to absorb nutrients from the soil.

The types of nutrients in the soil make a huge difference as well. Not all soil is alike. For example, some soils have more nitrogen, phosphorus, and other nutrients than others which can change the acidity of the soil and the ability for different types of plants to grow. That's one reason why a variety of plants grow in different climates. That's also the reason why one species of tomato will grow in Utah while another species can only grow in South America. We just have different climates and soil types.

"Producers" grow and raise food.

It's important to note that the production of food is a long process (seasonal from year-to-year). Emphasize with the students how long it takes for plants to grow and for beef and other livestock to be ready for us to butcher and eat.

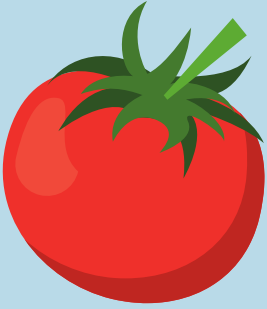
Ask the class how long they think it takes for a tomato plant to be grown vs. cattle to be raised for

beef.

It takes about 2-3 months for a tomato plant to grow. In comparison, it takes about 1-2 years for cattle to be ready for slaughter.

PROCESSING

**FOOD
PRODUCT**



**PACKAGING
AND ADDED
VALUE**

(SPICES, NUTRIENTS,
COLORING, ETC.)



**FINAL FOOD
PRODUCT**



Processing occurs when a food product is taken and packaged before distributing it to the consumer.

"Adding value" can also be done during this step. Spices, nutrients, and coloring among other additives may be incorporated into the food product to make it more appealing to the consumer.

For example, tomatoes may be blended and infused with spices like oregano before added to a can or jar in order to make it more appetizing and easier to use for pizza.

DISTRIBUTION

FINAL FOOD PRODUCT



SHIPPED TO

- STORAGE FACILITIES
- WHOLESALERS (COSTCO, SAM'S CLUB, ETC.)
- RETAIL

Distribution occurs once the food product is packaged. The food product can be shipped to storage facilities like a company's warehouse, wholesalers like Costco or Sam's Club, or retail locations like restaurants, cafés, or grocery stores.

This is one step where food safety can be a really big concern as temperature and humidity tends to vary depending on where a food product has to travel to and from. Most distribution companies will have a way to keep food cold so that bacteria and microorganisms don't grow out of control.

RETAIL

FINAL FOOD PRODUCT BOUGHT BY CONSUMER AT:



- GROCERY STORES
- RESTAURANTS
- CAFÉS



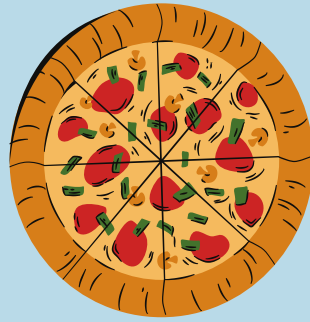
1. Have the students pick one of the three retail locations on the slide to talk about with a neighbor.
2. Have them recall a time recently that they visited one of these retail locations and have them share what they noticed about the convenience of these locations with their neighbor for a few minutes.

Questions to ask:

- How do they think it would be different if "distribution" and "retail" didn't exist in our society?
- If retailers and distributors didn't exist, is there anything new you'd have to learn to do in order to have food?

CONSUMPTION

CONSUMER EATS THE FINAL FOOD PRODUCT



RESOURCE RECOVERY

- COMPOSTING
- RECYCLING FACILITIES
- REUSED

**ALWAYS CHECK
CAN IT BE COMPOSTED OR
RECYCLED?**



There are three different ways to recycle natural resources that are left over from consumption:

"Composting" is when you take the peels or pits of produce and put them back in the soil in order to use their nutrients for future production.

"Recycling" is when recyclable materials like metals, plastics, and some styrofoams are taken to a recycling plant and converted to new material that can be used again for food products.

It's important to note that not all plastics, metals, or styrofoams can be recycled in every region. You need to check with your local facility to see what they can and cannot accommodate based on their equipment and infrastructure.

"Reusing" natural resources occurs when you use them again in your own home for either the original purpose or a new purpose. For example, old tin cans that used to hold green beans can be used to make candles and decorations for everyday use.

How far has your food traveled?

INSTRUCTIONS:

1. Look in your kitchen for 5 different food items coming from each of the 5 primary food groups (dairy, grains, meats/meat alternatives, fruits, vegetables).
2. Look at the packaging on each of these items and determine where the product came from.
3. Using Google maps, or another mapping service, determine the distance that each product had to travel to reach your household. Record the food item, origin source, and how many miles it traveled to reach you in the table below.

Please consider that many food products come from outside the United States. In fact, the USDA reports that sweeteners, fruits, tree nuts, sugar and confections, and some vegetables are often the most frequently imported items into the United States. Although the packaging may indicate that the product is from the U.S., be aware of these items that commonly travel further than you may realize.

Food Category and Item	Origin of Food Item	Distance Traveled
Dairy -----		
Grain -----		
Meat/Meat alternatives -----		
Fruit -----		
Vegetable -----		

How do you think buying locally can impact the environment?

Total miles: _____



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EXPLORING ORIGINS: WHERE OUR FOOD COMES FROM ASSESSMENT

Questions:

Circle One

- | | | |
|---|---|--------------|
| 1 | Producers grow and raise food. | True / False |
| 2 | All of the following are considered natural resources:

Coal, oil, natural gas, metals, stone, sand, plants and animals, air, sunlight, soil and water. | True / False |
| 3 | Brass comes from a natural resource. | True / False |
| 4 | All plastics can be recycled because all recycling facilities can process the same types of materials. | True / False |
| 5 | The largest producer of corn in the world is the United States. | True / False |
| 6 | Terrace farming is also known as the practice of “bee keeping”. | True / False |
| 7 | The distribution of food products occurs after processing them. | True / False |
-



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Answer Key:

1. True
2. True
3. False. Brass is man-made and comes from a variety of different elements like copper and zinc.
4. False. Materials that can be recycled will be different in each region depending on the equipment and infrastructure found at each recycling plant.
5. True
6. False. Apiculture is the practice of "bee keeping" Terrace farming is the cultivation of crops on the sides of hills or mountains.
7. True.