

# Feeding the Planet

## Lesson 4 - Sustainable Agriculture: Production

### National Learning Standards:

- HS-ETS1-1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
- RST.11-12.7 Integrate and evaluate multiple source of information presented in diverse formats in order to address a question or solve a problem.

**Grade Level:** 9-12

**Lesson Length:** 60 minutes

### Learning Objectives:

Participants will:

- Categorize agricultural commodities into the four uses of agricultural products – food, fiber, fuel, and shelter
- Define key terms related to food security
- Explore food security on a global scale, including affordability, availability, quality, and safety of various farm outputs

### Materials and Equipment Needed:

- Production Sustainability PowerPoint
- Butcher paper or tearsheet (1 per group)
- Markers and/or colored pencils
- Access to the internet
- Feeding the Planet Activity Sheets (1 per student)

### Cross-Curricular Connections:

Use these suggested adaptations to make learning across the curriculum easy!

Science	Technology	Engineering	Mathematics
Explore the impact of biological advancements in agricultural production methods. Suggested resource: Bringing Biotechnology to Life <a href="http://www.agfoundation.org/bringing-biotech-to-life/">http://www.agfoundation.org/bringing-biotech-to-life/</a>	Research the impact of planting and harvesting technology, such as GPS units in tractors.	Create a Venn Diagram to compare and contrast the engineering design of a piece of production equipment used today, and in the past.	Evaluate production and price data provided by the USDA Economic Research Service: <a href="https://www.ers.usda.gov/">https://www.ers.usda.gov/</a>

### Teacher Preparation:

- Print Feeding the Planet Activity Sheets
- Cut out butcher paper, if necessary
- Reserve access to computer lab, if necessary

# Lesson

## Introduction (Anticipatory Set): (5 minutes)

- **Step 1:** Food, fiber, fuel, and shelter are the main uses for agricultural products. Using the student worksheet, direct students to brainstorm as many agricultural products as they can that fit in each category.
- *What do all the items we listed have in common? Where do they come from? Why do farmers grow crops? These agricultural products, and many more, are demands that we as consumers place on the farmers and ranchers who grow crops and raise animals. They produce agricultural commodities because of basic supply and demand. Can we produce enough calories to meet our food, fiber, fuel and shelter needs for the growing population? Let's dig into each of the categories a little deeper to find out more.*

## Input and Modeling: (15 minutes)

- **Step 2:** *Let's focus in on our primary reason for growing crops – food – and let's look at one of the main concerns with food – whether or not people have it.*
- Have students define the three following terms using the fill-in-the-blank on their activity sheet.<sup>i</sup> Review to make sure everyone has the right terms written down.
  - **Food secure:** “no reported indications of food-access problems or limitations.”
  - **Food insecure:** “a household-level economic and social condition of limited or uncertain access to adequate food.”
  - **Hunger:** “an individual-level physiological condition that may result from food insecurity.”
- *What are the underlying factors affecting food security? See if any of the students can guess correctly, and then reveal the main factors.*<sup>ii,iii</sup>
  - Availability (and access)
  - Affordability
  - Quality and Safety (and utilization)
- *How is hunger in the U.S. different from other places around the world?*
  - Using a projector and screen connected to the internet, visit the Global Food Security Index website at <http://foodsecurityindex.eiu.com/Country>.
  - Show the class the U.S. and share with them the following information from the website:
    - Country name: U.S.
    - Overall food security ranking: 1
    - Challenges: n/a
    - Affordability: Food consumption as a share of household expenditure, presence of food safety net programs, and access to financing for farmers
    - Availability: Public expenditure on agricultural R&D and sufficiency of supply
    - Quality and safety: Nutritional standards and proportion of population under global poverty line

## Checking Understanding and Guided Practice: (20 minutes)

- **Step 3:** Direct students to form a group of three and choose any country, except the U.S., and gather the information listed below from the website. The students will create an infographic with that information. Have students hang posters on the wall when they're finished.
  - Country name
  - Overall food security ranking
  - Challenges
  - Affordability
  - Availability
  - Quality and safety

- Have students walk around the classroom looking at each poster when everyone is finished. Have a discussion about what students noticed.

### **Independent Practice: (10 minutes)**

- **Step 4:** Have students brainstorm ideas for how to solve those challenges they saw. Have them write their ideas on their handout and elicit student answers.

### **Wrap-Up (Review, Assess, Challenge): (10 minutes)**

- **Step 5:** Have students individually, or in pairs, visit [www.agfoundation.org/sustainability](http://www.agfoundation.org/sustainability) and complete the “Lesson 4 - Sustainable Agriculture: Production” module.
  - Challenge students to review the content and reflect in their notes two new concepts they discovered, and one question they still have.
  - Have students share their reflections and note information for continued investigation.

## Feeding the Planet Activity Sheet

### Directions

List as many agricultural products as possible in each category.

<b>Food</b>	<b>Fiber</b>
<b>Fuel</b>	<b>Shelter</b>

### Directions

Fill in the blanks to define these terms:

- **Food secure:** \_\_\_\_\_ reported indications of \_\_\_\_\_ problems or \_\_\_\_\_.
- **Food Insecure:** A \_\_\_\_\_ economic and \_\_\_\_\_ condition of limited or uncertain \_\_\_\_\_ to \_\_\_\_\_ food.
- **Hunger:** An \_\_\_\_\_ physiological condition that may result from \_\_\_\_\_.

Three factors affecting food security:

- 1.
- 2.
- 3.

## Food Security Infographic

**Website:** <http://foodsecurityindex.eiu.com/Country>

**Country name:**

**Overall food security ranking:**

**Challenges:**

**Availability:**

**Affordability:**

**Quality and Safety:**

**How can we help people be more food secure?**

## References:

- i. USDA ERS. (2016, October). *Definitions of food security*. Retrieved from <https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/definitions-of-food-security>
- ii. World Food Programme. (2017). *What is food security?* Retrieved from <https://www.wfp.org/node/359289>
- iii. The Economist Group. (2017). *Global food security index*. Retrieved from <http://foodsecurityindex.eiu.com/Country>