

Farming for the Future

*(Adapted with permission from the lesson *Starvation or Survival* developed by Barby and Vic Ulmer of *Our Developing World*. For related activities please visit *Our Developing World's* website at www.magiclink.net/~odw)*

OVERVIEW

Through a simulation activity, students experience the challenges, decisions, choices, and impacts that subsistence farmers in the developing world face. In “village” groups, students decide which crops they will plant over 2 seasons, during which time there are randomly assigned dry and wet years.

INQUIRY/CRITICAL THINKING QUESTIONS

- What are some of the challenges that subsistence farmers face in growing enough food to feed their families?
- What are the root causes of hunger and poverty, and how can they be addressed sustainably?

OBJECTIVES

Students will:

- Experience the challenges, decisions, choices, and impacts that subsistence farmers in the developing world face
- Understand some of the root causes of hunger
- Consider sustainable solutions to help alleviate poverty and hunger

TIME REQUIRED: 1 hour

KEY ISSUES/CONCEPTS

- **Food security**
- **Subsistence farming**
- **Hunger and malnutrition**
- **Sustainable agriculture**

SUBJECT AREAS

- **Social Studies**
(World History, Economics, Geography, Global Studies, Contemporary World Problems)
- **Science** (Life, Environmental)
- **Health and Nutrition**
- **Math**

NATIONAL STANDARDS CONSISTENCY

- **NCSS: 2, 3, 7, 9**
- **NSES: C, F**

GRADE LEVEL: 5–12



FTF Related Reading

- Intermediate: Chapter 5 from *Global Issues and Sustainable Solutions*
- Advanced: Unit 3, Chapters 1, 2, and 3 from *It's All Connected*

Vocabulary

- **Food Security** – Access by all people at all times to enough food for an active, healthy life (about 2,000 calories per day). Food security includes, at a minimum, availability
- of nutritionally adequate and safe foods, and an assured ability to acquire food in socially acceptable ways.
- **Subsistence Farming** – Small scale farming for the purpose of growing food to meet the needs of the family and/or community, as opposed to commercial for-profit farming.
- **Malnutrition** – A state of poor nutrition resulting from an insufficient, excessive, or unbalanced diet, or from an inability to absorb food.

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Materials/Preparation

- Handout/Overhead: *Farming for the Future Directions and Worksheet*, 1 copy per group of 3-4 students and 1 overhead
- Handout: *Effects of Malnutrition*, 1 copy per group of 3-4 students
- Handout: *Impact and Solution Cards*, make 1 copy and cut out cards, keep the Year 1 and Year 2 cards separate
- 1 six-sided dice

Activity

Introduction

1. Start out with an introduction question, such as “Do you remember a time when you were not sure where your next meal would come from and what did you do?” Or “have you ever grown your own food or worked on a farm?”
2. Go over the vocabulary words. Begin by asking the students to define: food security, subsistence farming, and malnutrition.
3. Tell the class they are going to do an activity to simulate subsistence farming in small villages in Africa.

Steps

1. Go over the directions using an overhead of the handout *Farming for the Future Directions and Worksheet*.
2. Arrange the class into “village” groups of 3-4 students and have each group choose a name for their village.
3. Give each group 1 *Farming for the Future Directions and Worksheet* and 1 *Effects of Malnutrition Chart*.
4. Villages have about 5 minutes to select the number and type of food crops they will

plant and fill in the “# of Fields” column on the worksheet.

5. Throw the dice (or have 1 student throw it) to determine Year 1 weather: 1, 2, 3, or 4 = a dry year; 5 or 6 = a wet year (typically there are more dry years than wet years in Africa).
6. Villages compute their food yields based on the weather and, in pencil, fill out the first part of the worksheet (up to the Total Yield line).
7. Have villages read off their village name, the crops they planted, and their total yield.
8. Have each village, one at a time, select a *Year 1 Impact Card* and read it aloud to the class. Tell them that some cards affect all the villages and some only apply to the village that draws the card.
9. Students fill out the Impact Loss line of their worksheet after each *Impact Card* is read. If students draw *Impact Cards* that impact *all* villages, then the Impact Loss line will need to be revised accordingly. Be sure they use a pencil so they can erase and rewrite the loss.
10. After all villages have selected and read an *Impact Card*, have students calculate the “Total Yield After Impact” and fill in that line of their worksheet.
11. Have students calculate malnutrition based on the *Effects of Malnutrition Chart* and fill in that line of the worksheet. Ask students why malnutrition effects will be felt the following year.
12. Call on each village to read aloud their calculated “Total Yield After Impact” and record it on the board or overhead so you can compare the different villages’ yields.

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13. Repeat the activity for Year 2 using the *Year 2 Solution Cards* in place of the *Year 1 Impact Cards*. There are 2 basic differences between Year 1 and 2. For Year 2, the effects of malnutrition from the previous year are included in the yield calculations, and the *Solution Cards* suggest sustainable practices to increase crop yield and improve quality of life (you do not need to tell the students that the Year 2 cards are all solutions).

14. Conclude with the following reflection questions via a class discussion and/or journal writing.

Assessment Reflection Questions

For Intermediate and Advanced Students

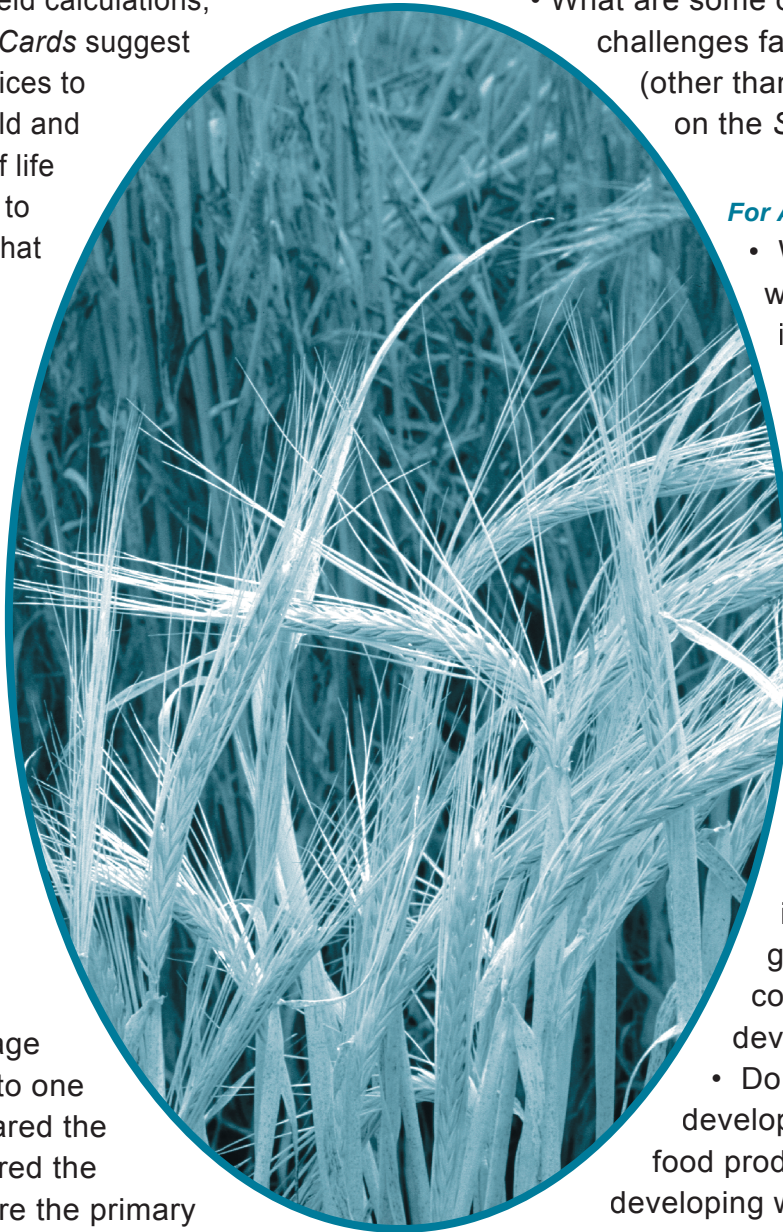
- How did the village yields compare to one another? Who fared the best and who fared the worst? What were the primary reasons for the differing yields?
- How did the *Impact Cards* change your situation as a subsistence farmer?
- What are the practical effects of living a life in which the line between starvation and survival is so fine?
- What do you think it would be like if this

simulation represented your own life, year in and year out?

- The activity provides all villagers with *Solution Cards* in Year 2. How realistic are the solution cards?
 - What are some other solutions to the challenges faced by the farmers (other than the ones offered on the *Solution Cards*)?

For Advanced Students

- What do you think would have happened if this cycle of low food production and malnutrition were to continue for several years?
 - What are structural solutions to the issues of hunger and food security?
 - What are some factors affecting whether or not solutions can be implemented (e.g. governance, NGOs, community-based development)?
 - Do people in the developed world impact food production in the developing world? If so, how? (e.g. type and amount of food we consume, water we use, or where we choose to buy our food).
- What other global issues are connected to the issue of food security?



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Writing Connection

- Research and write a paper or create a brochure about a developing world country, focusing on its food security and agricultural practices. Include a brief background on the country's demographics, hunger and poverty statistics, current agricultural practices, and recommendations for sustainable practices to improve quality of life.
 - Research and write an essay or article for the school paper about where your food comes from and how it reaches your community. Visit your local supermarkets, check the shelves, and talk to store managers. If you live in a farming/rural area, talk to farmers in your community and interview your parents and grandparents about the ways farming has changed in recent times. Find out if any food crops are grown in your area. Find out how much is grown locally and how much is transported from other states and countries. If much of your food is transported from locations far away, determine the impacts a shortage of fuel would have on food availability and price.
 - Research and write a report on trade agreements (like NAFTA), focusing on how these affect both subsistence farmers in developing countries and people in the developed world.
- community supported agriculture (CSA) www.nal.usda.gov/afsic/csa/, farmers' markets, and other local food production and distribution efforts in your community. Identify local individuals and organizations supporting these efforts and work with them to develop or improve your community's farmers' market to provide safe, local food for everyone in your community.
- Team up with a local food bank to develop a cookbook that includes tasty and nutritious recipes using the ingredients commonly found at the food bank. Students can also do live "cooking shows" at the food bank to demonstrate how to make the recipes.
 - Visit www.facingthefuture.org, click on **Take Action**, then **Fast Facts and Quick Actions** for information and action opportunities related to poverty and hunger.

Action Projects

- Define your "foodshed" by finding out what foods are grown in your region. What other food crops could be supported in your environment? Research



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Additional Resources

Films

- *Silent Killer: The Unfinished Campaign Against Hunger*, John DeGraaf, Bullfrog Films, 2005, 57 minutes. Highlights promising attempts in Africa, and in South and Central America, to end world hunger.
- *Santiago's Story*, TransFair USA, 2000, 15 minutes. This short film demonstrates how fair trade can make a difference in local communities.

Books

- *Hope's Edge: The Next Diet for a Small Planet*, Frances Moore Lappé and Anna Lappé, Jeremy P. Tarcher/Putnam, 2002. *Hope's Edge* includes the stories of subsistence farmers from 5 continents as well as an analysis of hunger, calls for action, learning resources, and recipes too.
- *Coming Home to Eat: The Pleasures and Politics of Local Foods*, Gary Paul Nabhan, W.W. Norton & Company, 2002. Chronicles a year spent by the author eating only from his local foodshed (growing, fishing, and gathering).

Websites

- www.oxfamamerica.org - Oxfam America is an international development and relief agency committed to developing lasting solutions to poverty, hunger, and social justice.
- www.fao.org – The Food and Agriculture Organization of the United Nations leads internationalefforts to defeat hunger, serving both developed and developing countries.

- www.transfairusa.org - Website of TransFair USA, a nonprofit organization that promotes and certifies fair trade products.
- www.foodfirst.org/12myths – Food First includes an online publication, 12 Myths About Hunger, Institute for Food and Development Policy, 1998.
- www.localharvest.org – A nationwide directory of farmers markets, CSAs, and other local food sources.
- www.foodsecurity.org - The Community Food Security Coalition (CFSC) is a North American organization dedicated to building strong, sustainable, local and regional food systems that ensure access to affordable, nutritious, and culturally appropriate food to all people at all times.
- <http://www.fian.org/fian/index.php> – FIAN International, the FoodFirst Information and Action Network, is a human rights organization that campaigns for the right to adequate food in over 60 countries in Africa, the Americas, Asia, and Europe.



Farming for the Future Directions and Worksheets

Student Names: _____

Village Name: _____

Directions:

- Your village has **10 small fields to plant**
- You must plant at **least 3 different crops** to ensure a variety of food types and **at least 2 fields must be protein crops**
- Determine your yields based on the **weather dice roll**:
1, 2, 3, 4 = dry year; 5, 6 = wet year
- Use a pencil to fill out the worksheet
- Chose an *Impact Card*, read it aloud, and calculate impact losses (some impacts will affect all villages and some will affect only your village)
- Determine the effect of malnutrition based on your final total yield and the *Effects of Malnutrition* chart
- Repeat activity for Year 2

Worksheet Year 1				
Type/Crops	# of Fields	Wet Yield Units	Dry Yield Units	Total Yields
ROOTS				
Yams		70	20	
Cassava		40	60	
CEREAL				
Maize		60	30	
Millet		30	60	
PROTEIN				
Groundnuts		50	30	
Peas		50	30	
Total Yield				
Impact loss (from card)				
Total Yield After Impact				
Next year's loss from malnutrition				

Worksheet Year 2				
Type/Crops	# of Fields	Wet Yield Units	Dry Yield Units	Total Yields
ROOTS				
Yams		70	20	
Cassava		40	60	
CEREAL				
Maize		60	30	
Millet		30	60	
PROTEIN				
Groundnuts		50	30	
Peas		50	30	
Total Yield				
Impact loss (from card)				
Loss from last year's malnutrition				
Total Yield After Impact and Malnutrition Loss				

Effects of Malnutrition

If food production falls below 450 units, your village will suffer from malnutrition and illness, affecting the residents' ability to work in the fields the following year. Use this chart to calculate malnutrition in your village based on the total food unit yield for each year.

Food Units	Loss from Malnutrition Next Year
450 and above	Lose 0 units
400-449	Lose 25 units
350-399	Lose 40 units
300-349	Lose 55 units
250-299	Lose 65 units
0-249	Lose 70 units

Impact Cards – Year 1

Flood

River bursts its banks, and since your village is located close to the river, your fields are flooded.

Your village loses 50 units

Normal Harvest

However “rust”, a plant disease, affects your village, reducing maize yield to 50 units for a wet year and 30 units for a dry year.

Your village calculates the loss of maize yield

Normal Harvest

However your village’s food storage has become damp, causing rot in 25% of your yams.

Your village calculates the loss of yam yield

Normal Harvest

However failure to rotate crops has lowered your yield. Cassava is very filling, easy to grow, and does not require much water but it depletes soil.

Your village reduces units by 60 if you grew 2 or more fields of cassava

Normal Harvest

However there has been political corruption in your village and a local government official has demanded that you pay him with food units.

Your village loses 40 units

Global Warming

Temperatures have been rising steadily. Many seeds are temperature sensitive and will not germinate at higher temperatures.

Each villages loses 50 units

AIDS

Several working-age villagers have contracted HIV/AIDS, reducing the number of workers available to grow crops.

Your village loses 70 units

Population Growth

More children were born in your village this year, requiring extra food to survive.

Your village subtracts an additional 40 units from the “loss from next year’s malnutrition” line

War

A civil war erupts in the region and soldiers from both sides overrun fields in all of the villages.

Each village loses 100 units

Debt Repayment

International lenders, who have given you loans, need to be repaid immediately. Your village must grow “cash crops” of flowers for export, reducing food crops for your people.

Your village loses 70 units

Solution Cards – Year 2

Farming Collective

All the villages form a collective to learn and share sustainable farming practices.

Each village's yield increases by 50 units

A Community Well

After several years of drought, a non-governmental organization (NGO) offers to work with your village to construct a well.

Your yield increases by 60 units

Experimental Field

You plant a field of maize using compost and drip irrigation. The irrigation water is from a rooftop water catchment system, since rain is your only water source.

Your village gains 20 units for each maize field planted

Digging Ditches

You spend several weeks digging contour ditches, which help conserve water and prevent soil erosion.

Your village's yield increases by 30 units

Rotate Crops

Your village decides to rotate maize and groundnut crops. Groundnuts enrich the soil with nitrogen, doubling the yield of your maize crops.

Your village doubles its maize crop units

Literacy Class

Several people in your village join a literacy class and, now able to read the directions on a natural pesticide sack, they find that you need less than you have been using.

Your village gains 10 units because of the money saved on pesticide

Composting

Your village decides to start using compost and can thus reduce the buying of expensive fertilizers.

Your village saves money and is able to increase crop yield by 20 units

Health Center

A regional health center opens, providing primary and reproductive healthcare to all villages. The health center teaches reproductive health classes. After time, birth rates begin to stabilize and all villages require less food to survive.

All villages revise the malnutrition chart so only 400 food units are needed to prevent malnutrition