a **Common Threads** resource

Cultivating an understanding of **food security**

OSSTF/FEESO

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Common Threads IV
HUNGRY FOR CHANGE

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· ON THE MENU ·

* PowerPoint included

+ SmartBoard lesson included

INTRODUCTION

"I'm hungry." As a complaint, a demand or a simple statement, this short phrase articulates the most simplest of our basic needs. The issues surrounding food, however, are anything but simple. Around the world, as the number of mouths calling out to be fed continues to increase, the way in which we grow, distribute and consume our food is becoming more complicated. No longer simply grown and eaten, food is now produced, designed, engineered, analyzed, graded, packaged, marketed, and politicized. Food has become a topic to be studied and a commodity to be traded. It has become a tool to be manipulated by an ever demanding economy—a means to further divide the haves from the have-nots.

Raising people's awareness of the complexity of food-related issues can be a challenge. *Hungry For Change*, our fourth Common Threads initiative, brought together members from across the province who were interested in tackling the complex issues surrounding food. They travelled to Brazil and throughout Ontario in their search for best practices. Their goal was to explore these issues and bring them to the classroom in a thoughtful and meaningful way. The resulting lesson plans and movie have been organized into five topical areas of study. We hope you will find this five course meal enjoyable.

What's in your food?

The food on your plate looks beautiful, smells wonderful and tastes delicious, but is it healthy and nutritious? No longer merely sustenance, food has taken on new roles in our lives. It satisfies our desires, it brings us together with our friends, and it regulates our daily schedules. We expect our food to do so much more for us than simply sustain us, but have we lost focus on its original purpose. Do you know how safe your food is or even what's in it?

Where does your food come from?

Food's journey, from the seed to the ground to the plate, has become much more complex. Globalization has resulted in food travelling thousands of kilometres before reaching our plate. Hybridization and genetic manipulation has allowed us to create designer food. Pesticides and herbicides have provided greater crop yields. While some farmers embrace these changes in agriculture, others are returning to traditional methods. Is science's ability to engineer food a boon to humanity or is it a sign that we have lost our way?

The politics of hunger

The citizens in one part of the world are in danger of having their lives cut short due to over-eating while the citizens in another are starving. The value of food is traded internationally just as commodities such as steel and gold are. Some nations strive to be self-sufficient in their food production, while others call for equitable distribution across the world. Can we afford to treat food as merchandise?

Food or fuel

Ethanol has been touted as the world's answer to both the energy and the environmental crisis. Not only is it a renewable source but it takes less energy to produce than gasoline and creates significantly fewer harmful emissions. But ethanol is produced from crops that could be otherwise directed to feed people. Are biofuels ethical?

The future of food

As our world changes so do the demands that we put on it. A marked increase in population has coincided with great leaps in technology. Our climate is changing as are our expectations of the value, variety and convenience of our food. Can the way we produce food adapt to the changing demand of our population? What food choices should we be making in our schools and in our lives?

ICEBREAKERS

Estimated time 5—15 minutes each

Overall expectations Not Applicable

Enduring understanding Teamwork, Communication

Prior learning None

Getting ready

Varies according to the Icebreaker chosen:

Icebreaker 1: Photocopy BLM 1 for each student
Icebreaker 2: Secure a data projector and computer. Or, print, in colour, BLM 2 for each group.
Icebreaker 3: No preparation needed
Icebreaker 4: No preparation needed
Icebreaker 5: No preparation needed
Icebreaker 6: Photocopy BLM 3 and cut out each of the cards
Icebreaker 7: Photocopy BLM 4 for each student
Icebreaker 8: Photocopy BLM 5 and cut out each of the cards
Icebreaker 9: Photocopy BLM 6 for each group
Icebreaker 10: Photocopy BLM 7 for each student or group

Teaching & learning strategies

Teachers can choose an Icebreaker to use at the beginning of a unit or lesson. Each of these is designed to get students thinking about food and food related issues. They are also planned as class-building activities so that students will have a chance to get to know their peers better.

Icebreaker 1 Food Letter Challenge (10 minutes)

1. Hand out BLM 1: An Alphabet of Food
2. Students attempt to come up with a food for each letter of the alphabet. After 5 minutes, students move around the classroom to get ideas from classmates for any letters they are missing.

Icebreaker 2 Read the picture! (10-15 minutes)

1. Put the students into groups of 4.
2. Show the PowerPoint presentation (or give each group a copy of BLM 2: Read the picture!). The students will work together to answer the questions.
3. Answers will vary, but here are some suggestions for each set of questions:
   A. Opinion
   B. Because ethanol prices are cheaper, consumers may choose to purchase the ethanol—this may have positive impacts on the environment, such as less greenhouse gases may be emitted. However, agricultural land may be used to produce ethanol instead of food, which may negatively influence food production.
   C. They could be considered healthy since there are no chemical fertilizers or pesticides used. However, the oranges are being consumed by insects, which may negatively influence the health of the oranges.
   D. Food purchased from street vendors may be fresher, cheaper and more convenient. However, safety standards may not be met.
   E. Various crops are grown together here (inter-cropping). The cattle are supposed to be there—they have not escaped from their field! The cattle have been tethered.
   F. Traditional food production techniques provide more jobs for people (because they are labour intensive) and can have less impact on the environment. Modern food production techniques often lead to higher levels of production and may have lower costs per unit of food produced.
   G. This area has been burned in a mistaken attempt to revitalize the land.
   H. Opinion

Icebreaker 3 Stand up if you… (5 minutes)

1. The teacher poses various statements and students stand up if it applies to them. Suggestions:
   Stand up if you…
   …live or work on a farm
   …have visited a farm
   …have eaten an imported food
   …have shopped at a farmer's market
   …eat organic food
   …have a food allergy
   …like Chinese food (or substitute another ethnic food)
   …have ever used Canada's Food Guide to Healthy Eating

Icebreaker 4 Food Groups (10-15 minutes)

1. The teacher tells the class to stand up and then tells the class to form groups according to what their favourite cereal is (or Fruit, Vegetable, Snack food, Junk food, Dessert, Fast food restaurant, Ethnic food, etc.).
2. Students move around the room and form groups based on their favourites. Note: Have an "Other" group for those students who are the only one who likes a particular option. These students can form an "Other" group together.
3. After students have formed groups they could:
   a) Come up with a cheer or commercial for their choice, and/or
   b) Continue to have the students re-group using a different category of food.

Icebreaker 5 Line up (5-7 minutes)

1. The teacher tells the class to stand up. Then, the teacher tells the class to line up in a line that ranges from "Strongly agree" at one end to "Strongly disagree" at the other end, according to their opinion on a statement. Statements could include:

- Countries should not export food to other countries.
- Countries should not send food aid to poorer countries.
- High-fat foods should have warning labels on them, like those on cigarette packages.
- People should eat only locally-grown produce.
- All foods should be grown organically, without chemical fertilizers or pesticides.
- Food crops should not be used to produce fuels.

2. The teacher then "slides the line." To do this, cut the line in half and move one half of the line forward so that students are paired up. This means that students with strong opinions will be paired with someone of a more moderate opinion.
3. Give each student 30 seconds to explain their position to their partner.

Icebreaker 6 Pair Up! (5 minutes)

1. Each student is given a card with either the name of a food or the name of a country (BLM 3).
2. Students must circulate around the classroom to find their match. Each food matches up with a country of origin.

Icebreaker 7 BINGO! (10-15 minutes)

1. Each student is given a Bingo card (BLM 4). Students must circulate around the room and find other students who fit each description. The student then signs their name in the appropriate square. Each student can only be used once.
2. Then, using a class list, the teacher calls out the names of students in the classroom. Students play Bingo until they get a complete line.

Icebreaker 8 Complete that quote (15 minutes)

1. Each student is given a piece of paper with one half of a quote written on it (BLM 5). Students then move around the classroom and try to find the person with the paper that completes their quote (Answer Sheet provided—BLM 5 Solutions).
2. When finished, put four pairs of students together. They should read their four quotes and determine which they like the best and least, and why.

Icebreaker 9 Search for the slogan (10 minutes)

1. Put students into groups of four and give each group a copy of BLM 6: Search for the slogan. Working with their group, they must match each company or product with its slogan (Answer Sheet provided—BLM 6 Solutions).
2. When finished, each group selects five slogans and discusses the reasoning behind each slogan—what message is the company trying to send to the public? Why did each company choose the slogan it did? Is the slogan an accurate representation of the company or product?

Icebreaker 10 Riddle Activity (10 minutes)

1. Students may work alone or in groups for this activity. Provide a copy of BLM 7 to each student or group.
2. Students will solve the "What Am I?" riddles. If needed, provide a list of possible answers to choose from. Here is a list you may provide for students: Meat, Population, Drought, Grain, Money, Temperature, Water, Ethanol, Oil, Climate, Air.
3. Correct Answers: 1) Oil; 2) Ethanol; 3) Climate; 4) Meat; 5) Grain; 6) Money

Food Letter Challenge

Name a food for each letter of the alphabet!

A	B	C	D	E
F	G	H	I	J
K	L	M	N	O
P	Q	R	S	T
U	V	W	X	Y
Z	Which of these do you regularly consume? Which of these **must** be imported?			

Read the Picture

READ THE PICTURE

Common Threads IV

Common Threads IV – Read the picture!

A

Are these meals healthy? Would you eat these meals?

1

2

3

4

Common Threads IV – Read the picture!

B

The price on the left is for gasoline and the price on the right is for ethanol. What impacts do these prices have on transportation choices and greenhouse gas emissions? What impacts do these prices have on food production?

Common Threads IV – Read the picture!

C

Are these organically-grown oranges healthy? Why or why not?

Common Threads IV – Read the picture!

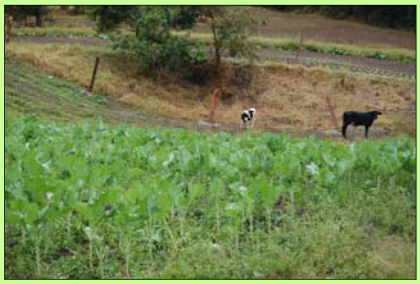
D

Is this typically how you buy your food? What are the advantages and disadvantages of purchasing your food this way?

Common Threads IV – Read the picture!

E

What types of farming do you see? Should the cattle be there?



Common Threads IV – Read the picture!

Read the Picture

F

Which is the better method for producing food?

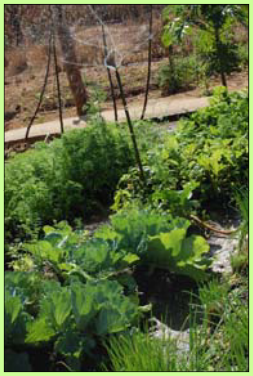
Common Threads IV – Read the picture!

G

What's happened here? Is this area "alive" or "dead"?

Common Threads IV – Read the picture!

H



Agriculture accounts for two-thirds of the freshwater consumed world-wide. Should the world's drier regions be allowed to use freshwater to irrigate their crops?

Common Threads IV – Read the picture!

Pair up!

Schnitzel	**Austria**
Nanaimo Bars	**Canada**
Empanada	**Chile**
Dim Sum	**China**
Doro Wat	**Ethiopia**
Souvlaki	**Greece**
Tandoori Chicken	**India**
Mee Goreng Udang	**Indonesia**
Matzo ball soup	**Israel**
Pizza	**Italy**
Jerk chicken	**Jamaica**
Sushi	**Japan**
Falafel	**Lebanon**
Burritos	**Mexico**
Couscous	**Morocco**
Cabbage Rolls	**Poland**
Borscht	**Russia**
Pad Thai	**Thailand**
Pierogies	**Ukraine**
Haggis	**United Kingdom**
Pho	**Vietnam**

BINGO!

B	I	N	G	O
Has visited farm	Has eaten at a buffet	Has tried sushi	Has planted a garden	Has a food allergy
Doesn't drink soft drinks	Has shopped at a farmer's market	Has eaten a food grown in South America	Has gone to a "pick your own" farm	Likes spicy food
Knows how to bake a cake	Eats organic food	**FREE**	Is addicted to coffee	Has never eaten Chinese food
Has eaten East Indian food	Has taken a cooking course	Reads the labels on food packages	Has pumped ethanol gas	Brings their lunch to school
Has donated to or worked at a food bank	Loves chocolate	Cries when slicing onions	Has cooked supper for their family	Knows what the Canada Food Guide is

Complete that quote

the destiny of countries	depends on the way they feed themselves
tell me what you eat	and I will tell you what you are
hunger is	the best sauce in the world
more die in the United States	of too much food than of too little
hunger knows no friend	But its feeder
if a free society cannot help the many who are poor	it cannot save the few who are rich
a hungry man	is not a free man
we should look for someone to eat and drink with	before looking for something to eat and drink
if we can conquer space	we can conquer childhood hunger
the dual scourge of hunger and malnutrition will be truly vanquished not only when granaries are full	but also when people's basic health needs are met and women are given their rightful role in societies
if you desire peace, cultivate justice, but at the same time	cultivate the fields to produce more bread; otherwise there will be no peace

Complete that quote

there are people in the world so hungry	that God cannot appear to them except in the form of bread
there's enough on this planet for everyone's needs	but not for everyone's greed
every gun that is made, every warship launched, every rocket fired signifies, in the final sense	a theft from those who hunger and are not fed, those who are cold and are not clothed
if you want to eliminate hunger	everybody has to be involved
imagine no possessions **I wonder if you can**	no need for greed or hunger a brotherhood of man
starvation is the characteristic of some people not having enough food to eat	it is not the characteristic of there being not enough food to eat
There is no finer investment for any community	than putting milk into babies
hungry people cannot be good at learning or producing anything	except perhaps violence
if you can't feed a hundred people	then just feed one

Complete that quote—solutions

1.	the destiny of countries	depends on the way they feed themselves	*Anthelme Brillat-Savarin*
2.	tell me what you eat	and I will tell you what you are	*Anthelme Brillat-Savarin*
3.	hunger is	the best sauce in the world	*Cervantes, Don Quixote*
4.	more die in the United States	of too much food than of too little	*John Kenneth Galbraith*
5.	hunger knows no friend	but its feeder	*Aristophanes*
6.	if a free society cannot help the many who are poor	it cannot save the few who are rich	*John F. Kennedy*
7.	a hungry man	is not a free man	*Adlai Stevenson*
8.	we should look for someone to eat and drink with	before looking for something to eat and drink	*Epicurus*
9.	if we can conquer space	we can conquer childhood hunger	*Buzz Aldrin*
10.	the dual scourge of hunger and malnutrition will be truly vanquished not only when granaries are full	but also when people's basic health needs are met and women are given their rightful role in societies	*Gro Harlem Brundtland*
11.	if you desire peace, cultivate justice, but at the same time	cultivate the fields to produce more bread; otherwise there will be no peace	*Norman Borlaug*
12.	there are people in the world so hungry	that God cannot appear to them except in the form of bread	*Gandhi*
13.	there's enough on this planet for everyone's needs	but not for everyone's greed	*Gandhi*
14.	every gun that is made, every warship launched, every rocket fired signifies, in the final sense	a theft from those who hunger and are not fed, those who are cold and are not clothed	*Dwight D. Eisenhower*
15.	if you want to eliminate hunger	everybody has to be involved	*Bono*
16.	imagine no possessions I wonder if you can	no need for greed or hunger a brotherhood of man	*John Lennon*
17.	starvation is the characteristic of some people not having enough food to eat	it is not the characteristic of there being not enough food to eat	*Amartya Sen*
18.	There is no finer investment for any community	than putting milk into babies	*Sir Winston Churchill*
19.	hungry people cannot be good at learning or producing anything	except perhaps violence	*Pearl Bailey*
20.	if you can't feed a hundred people	then just feed one	*Mother Teresa*

Search for the slogan

Match each slogan with the correct company or product name.

7-up	East Side Mario's	McDonald's	Subway	Burger King
Frosted Flakes	Campbell's Soup	Swiss Chalet	Milk	Harvey's
Oh Henry	Taco Bell	Coke	KFC	Pizza Pizza
Tim Hortons	Diet Pepsi	Kit Kat	Pringles	Wendy's

	967-11-11
	A taste of little Italy
	Always fresh
	Do what tastes right
	Eat fresh
	Family happens
	Finger licking good
	Have a break
	Have it your way
	I'm loving it
	It does a body good
	It's the real thing
	M'm M'm good
	Makes your hamburger a beautiful thing
	Oh hungry?
	Once you pop you can't stop
	Taste the one that's forever young
	The un-cola
	They're grrrreat!
	Think outside the bun

Search for the slogan—solutions

Pizza Pizza	967-11-11
East Side Mario's	A taste of little Italy
Tim Hortons	Always fresh
Wendy's	Do what tastes right
Subway	Eat fresh
Swiss Chalet	Family happens
KFC	Finger licking good
Kit Kat	Have a break
Burger King	Have it your way
McDonald's	I'm loving it
Milk	It does a body good
Coke	It's the real thing
Campbell's Soup	M'm M'm good
Harvey's	Makes your hamburger a beautiful thing
Oh Henry	Oh hungry?
Pringles	Once you pop you can't stop
Diet Pepsi	Taste the one that's forever young
7-up	The un-cola
Frosted Flakes	They're grrrreat!
Taco Bell	Think outside the bun

Riddle Activity

Teachers should photocopy this page and cut off instructions/answers before handing out to students. Students work alone, in pairs, or small groups to solve the following "What am I?" riddles. If needed, provide a possible list of answers to choose from (see below).

Choose answers from this list: Meat, Population, Drought, Grain, Money, Temperature, Water, Ethanol, Oil, Climate, Air. Correct Answers: 1) Oil; 2) Ethanol; 3) Climate; 4) Meat; 5) Grain; 6) Money

Riddle 1

I exist, but I can't be made.
China is using more of me than ever before.
Canada is wondering how to replace me.
Pineapples and bananas need me to get to you.
Apples and tomatoes? Not so much.
The food on your table is there thanks to me,
but I'm a hidden ingredient in the farm-to-table link.
What am I?

Riddle 2

I'm found in vodka and Volvos,
and I help show the heat rise.
Brazil is one of my largest producers,
using sweetness to make their cars go.
Canada wants to produce more of me,
turning solid yellow into liquid blue.
Some say I am the answer to a global problem,
others say I am a cause.
What am I?

Riddle 3

I can be hot, cold, wet, or dry,
and lately I've gone to extremes.
Humans didn't create me,
yet they have a way of making me change.
Usually I'm harmless,
but depending on my mood, I can be deadly.
Some people don't give me much thought,
others worry I will wreak havoc in their lives.
What am I?

Riddle 4

Some people avoid me altogether,
Others consume a lot of me every day.
Some people can't bear to think
of what I used to be.
I can be the first thing off the list
when money is tight.
A lot of resources are needed,
to produce just a little bit of me.
What am I?

Riddle 5

In the summer you might see great piles of me,
but now my reserves are shrinking.
Most people take me for granted,
because I've been around longer than sliced bread.
You can consume me,
or consume something that consumed me first.
I come in many forms,
and I travel with thousands like me.
What am I?

Riddle 6

You can't eat me, but it's hard to eat without me.
I talk without saying a word.
I can grow, but I'm not alive.
I make people smile, but I have no personality.
Most people are happy to hold me,
but I don't feel a thing.
Some make lots of me with only a little to start,
but be warned: I go as easy as I come.
What am I?


Nutrition Facts
Serving Size 1/2 cup (39g) dry
Servings Per Container about 13
Amount Per Serving
Cereal
Cereal with 1/2 cup Skim Milk
Calories
140
190
Calories from Fat
25
30
% Daily Value**
5%
5%
Total F

Estimated time required 3 classes of 75 minutes
Lessons are meant to be successive with the required work completed over the duration of the 3 classes.

Overall Expectations

This lesson has two distinct parts. The first two lessons focus on the use of food labels to determine the ingredients used and the nutritional content of a packaged food product. Students will learn about the function of food labels to market a food, as well as to educate the consumer, and the need for consumer education to see through product marketing claims, in order to ensure that nutritious choices are made.

The second part of the lesson focuses on Canada's Food Guide (2007), as well as food guides around the world (Powerpoint presentation). Students will compare the various guidelines and use their knowledge of various cultures, foodstyles and environments to determine the factors that contribute to the development of Food Guides in various countries. Time permitting, students can also compare their personal eating habits to Canada's Food Guide. They can use an on-line nutrition analysis program to evaluate their eating habits and create a plan to improve their dietary health.

Enduring understanding

Students will gain a deeper understanding of what they eat and what is recommended for a healthy diet. They will learn to decipher food labels and ingredient lists, so they can make informed decisions. They will be introduced to various food additives found on food labels, what they are derived from, and the effects they have on one's health.

Prior Learning

This activity can stand alone or work into various classes and units. Prepare students by having them bring their lunch to class. Have students keep a log of their daily food intake using the log handout provided.

Getting Ready

Duplicate the black line masters for students:

Lesson 1	BLM 1A-1 My Food Log
Lesson 2	BLM 1A-2A Activity Sheet—Figure Out the Facts
	BLM 1A-2B Activity Sheet—Figure Out the Facts
	BLM 1A-3A Activity Sheet—Percentage Daily Value
	BLM 1A-3B Activity Sheet—Percentage Daily Value
	BLM 1A-4 Serve It Up or Serve It Down
	BLM 1A-5 Carbohydrates—Plan Meals
	BLM 1A-6 Carbohydrates—Compare the Facts
	BLM 1A-7 Carbohydrates—Serving Size
Lesoon 3	Book a computer lab.
Lesson 4	BLM 1A-8 Comparison of International Food Guides

Lesson 1 Understanding Food Labels

Food labels are the primary method that consumers have for making knowledgeable food choices. It is important to be able to read a food label and determine what information is for marketing purposes, and what is required nutritional information.

1. Ensure that each student has a labeled food product. Have the students read the label, and indicate the various things that they see. Classify these on the board into three columns:
- Manufacturer and product information (company name, manufacturing dates, contact information, product name, place of product origin, weight of package (net contents), etc.
- Nutrition Information (ingredient list, nutrition facts table, legitimate nutrition claims).Marketing Information (photos, recipes, fonts, health check symbols, coupons, colourful lettering).
2. Ask students to brainstorm reasons for organizing the aspects of the label in the manner that appears on the board. A discussion of the importance of each aspect should follow. Possible responses may include:
- Manufacturer information—good for product recalls, etc. (remind them of the Listeria outbreak of 2008, some of the recent recalls regarding melamine in foods from China, etc.) Product location—helps to identify local or imported foods.
- Nutrition Information—required for wise nutritional choices, low calorie diets, diabetics, reduced cholesterol diets, trans fats, etc.).
- Marketing—designed to sell the product.
3. Ask students if they have any food labels or have seen food labels that they feel mislead the consumer—discussion can follow. List examples supplied by students on the board. This will lead to the main lesson on reading and understanding food product labels from the point of view of good nutrition.

Homework: Hand out a food log, BLM 1A-1, to each student and have them record the foods and drinks they consume over a 24-hour period. If possible, they should save the labels of packaged foods that they consume for later use.

Lesson 2 Reading Nutrition Labels

Download Educator Resources from http://www.healthyeatingisinstore.com/program_resources.asp

Duplicate BLM 1A-2 to 1A-4 for students. BLM 1A-5 to 1A-7 can also be used as supplementary material. This information has been prepared by Dietitians of Canada for educational purposes. Fact sheets are provided at the end of the lesson, after BLMs.

1. Review with students the 3 components of Nutrition Labelling (ingredient list, Nutrition Facts Tables and Nutrition Claims).
2. Follow the Instructor's Guide Lesson as written or adapt as needed. Resources on this site include a PowerPoint presentation for educators as well as Black Line Masters of the presentation and worksheets for consumer/student use.

Lesson 3 Understanding Food Requirements in Canada's Food Guide

In Lesson 3, students create their own personalized copy of Canada's Food Guide using Health Canada website.

Write the following websites on the board:

- **Create your own food guide:**
  http://www.hc-sc.gc.ca/

Follow the links to "Create your own Food Guide". Ensure that the school internet security will permit printing of individual food guides, as the student will be directed to a pop-up site for printing. If this cannot be done, assign this task as homework.

- **Analyze your dietary habits:**
  www.eatracker.ca

Students can assess their personal food intake. This site requires logging in, and will maintain a record of previous food intake as well as activity analyses. Individual reports can be generated indicating positive aspects of lifestyle as well as areas for improvement.

Activity:

1. Students access Health Canada website and create their personalized food guide.
2. Students then access Dietitians of Canada site, and using their food intake record, analyze their personal nutrition intakes.

Notes: Ensure that students understand that the Food Guide is a guideline established by Health Canada to ensure basic nutritional adequacy in the general healthy population. Each food is classified into a food group based on its average nutritional content. A variety of foods within each food group are needed to ensure that all of the essential nutrients are consumed regularly to ensure good health.

Reflective Activity

Students can review their dietary analysis, and indicate where they are doing well, as well as develop a plan for improvement of their dietary and exercise routines.

Using their food intake analysis as a resource, have students brainstorm the ways that they see processed foods impacting on their nutritional status. Students can compare their results with those of other students. They will likely conclude that processed foods result in increased sodium intake, increased intake of sugar and high-fructose corn syrup, increased intake of saturated fats, higher intake of calories, as well as high intake of "synthetic" foods with chemical names that are all indicators of excessive processing.

Discussion: What might be the impact of continued high consumption of these common additives and processed food products?

What is the ideal recommended eating pattern?

1. Review recommendations contained in Canada's Food Guide.
2. Eat foods with minimal processing, including fresh fruits and vegetables, whole grain products, low fat dairy products, low fat meat and alternatives.
3. Use table salt in moderation to limit sodium intake.

Possible answers may include:

- Sodium—contributes to high blood pressure; most North Americans exceed the recommended maximum intake of 2500 mg/day.
- Sugar, corn syrup, fats, calories—contain empty calories (little to no nutrition for the calories contained in the food which can lead to obesity); North Americans tend to eat more calories than they expend through activity leading to an "obesity epidemic".

Lesson 4 Comparing Canada's Food Guide to Various International Food Guides

In this lesson, students will analyze their personal food intake based on the homework given in the previous lesson.

Teacher will use the Powerpoint presentation on CD. A hard copy of the Powerpoint is included after lesson BLMs. To view the revised US guide, an LCD projector should be connected to the internet, or book a computer lab to access food guides from various countries around the world. One good link to follow: *http://www.senba.es/recursos/piramides/pictorials_nutrition_guides.pdf*

Students should review the various guides, and record the differences seen between the various guides using BLM 1A-8.

What might be some of the influences contributing to the differences in the different food guides?

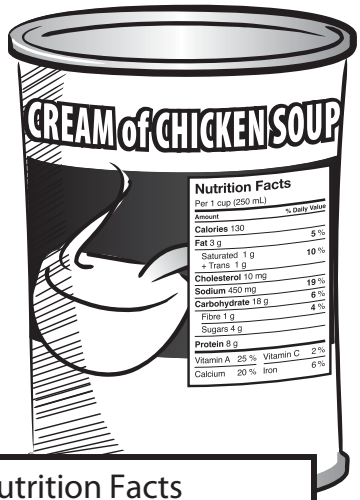
Suggestions: geography and climate, seasonal variations in food availability, cultural eating patterns, impact of the local food production, national health priorities). To support this topic, the following YouTube video can be shown: *http://www.senba.es/recursos/piramides/pictorials_nutrition_guides.pdf*

My food log

Meal/Time of Day	Food Eaten	Amount	Labelling Notes, Food Contents
Example: Lunch	Cheeseburger	1	Large bun, 4 oz. beef patty, 1 slice cheese, tomato, lettuce, mustard

Figure out the facts

What does the Nutrition Facts table tell you about this packaged food?



1. What is the serving size? _____

2. How many Calories are in one serving? _____

3. How many grams of fat are in one serving? _____

4. Circle one nutrient on the Nutrition Facts table that is important to you. Circle the % Daily Value for this nutrient.

5. Decide if you want to get less or more of the nutrient you have circled:

   ❑ Get less of this nutrient
   (Hint: Choose packaged foods with a low % Daily Value.)

   ❑ Get more of this nutrient
   (Hint: Choose packaged foods with a high % Daily Value.)

Nutrition Facts

Per 1 cup (250 mL)

Amount	% Daily Value
Calories 130	
Fat 3 g	**5** %
Saturated 1 g + Trans 1 g	**10** %
Cholesterol 10 mg	
Sodium 450 mg	**19** %
Carbohydrate 18 g	**6** %
Fibre 1 g	**4** %
Sugars 4 g	
Protein 8 g	

Vitamin A	25 %	Vitamin C	2 %
Calcium	20 %	Iron	6 %

6. Is this food a good choice for you?

   ❑ Yes- Why?_____

   ❑ No - Why?_____

Figure out the facts

What does the Nutrition Facts table tell you about this packaged food?

1. What is the serving size? _____

2. How many Calories are in one serving? _____

3. How many grams of fat are in one serving? _____

4. Circle one nutrient on the Nutrition Facts table that is important to you. Circle the % Daily Value for this nutrient.

5. Decide if you want to get less or more of the nutrient you have circled:

   ❑ Get less of this nutrient
   (Hint: Choose packaged foods with a low % Daily Value.)

   ❑ Get more of this nutrient
   (Hint: Choose packaged foods with a high % Daily Value.)

6. Is this food a good choice for you?

   ❑ Yes- Why?_____

   ❑ No - Why?_____

Nutrition Facts

Per

Amount	% Daily Value
Calories	
Fat g	%
Saturated g + Trans g	%
Cholesterol mg	
Sodium mg	%
Carbohydrate g	%
Fibre g	%
Sugars g	
Protein g	
Vitamin A %	Vitamin C %
Calcium %	Iron %

Compare foods using percent Daily Value (% Daily Value)

Use % Daily Value to decide which of these two yogurts is the better choice for you.

Nutrition Facts

Per 3/4 cup (175 g)

Amount	% Daily Value
Calories 110	
Fat 3 g	**5** %
Saturated 2 g + Trans 0 g	**10** %
Cholesterol 10 mg	
Sodium 125 mg	**5** %
Carbohydrate 12 g	**4** %
Fibre 0 g	**0** %
Sugars 8 g	
Protein 9 g	

Vitamin A	4 %	Vitamin C	2 %
Calcium	30 %	Iron	0 %

Nutrition Facts

Per 3/4 cup (175 g)

Amount	% Daily Value
Calories 170	
Fat 10 g	**15** %
Saturated 6 g + Trans 1 g	**35** %
Cholesterol 30 mg	
Sodium 100 mg	**4** %
Carbohydrate 13 g	**4** %
Fibre 0 g	**0** %
Sugars 6 g	
Protein 7 g	

Vitamin A	10 %	Vitamin C	2 %
Calcium	25 %	Iron	0 %

1. Circle the % Daily Value for fat on both Nutrition Facts tables shown above.
2. Shade in the % Daily Value for fat on each % Daily Value scale shown above.
3. What do you want to do with the fat?

   ❑ I want to get less of this nutrient. (Hint: Choose packaged foods with a low % Daily Value.)

   ❑ I want to get more of this nutrient. (Hint: Choose packaged foods with a high % Daily Value.)

4. Which yogurt is the better choice for you?

   ❑ Yogurt A - Why?_____

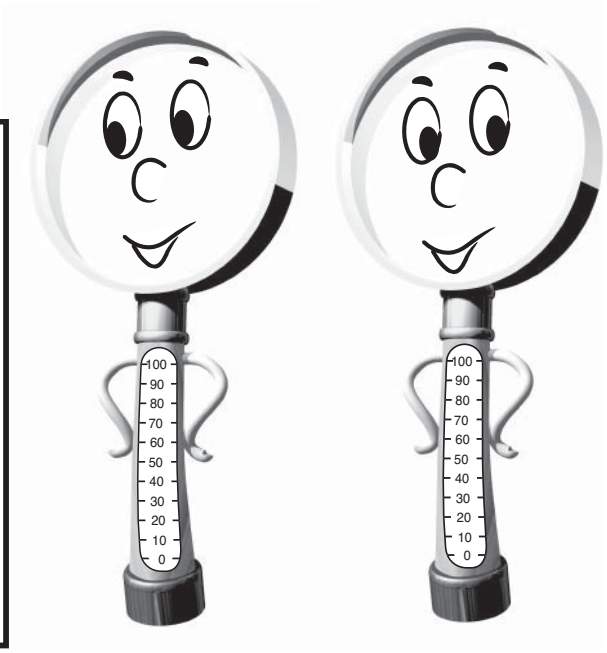
   ❑ Yogurt B - Why?_____

Compare foods using percent Daily Value (% Daily Value)

Use % Daily Value to decide which of these two packaged foods is the better choice for you.

FOOD A

Nutrition Facts			
Per			
Amount			**% Daily Value**
Calories			
Fat	g		%
Saturated + Trans	g		%
Cholesterol	mg		
Sodium	mg		%
Carbohydrate	g		%
Fibre	g		%
Sugars	g		
Protein	g		
Vitamin A	%	Vitamin C	%
Calcium	%	Iron	%



FOOD B

Nutrition Facts			
Per			
Amount			**% Daily Value**
Calories			
Fat	g		%
Saturated + Trans	g		%
Cholesterol	mg		
Sodium	mg		%
Carbohydrate	g		%
Fibre	g		%
Sugars	g		
Protein	g		
Vitamin A	%	Vitamin C	%
Calcium	%	Iron	%

1. Choose one nutrient that is important to you.
2. Circle this nutrient and its % Daily Value on both Nutrition Facts tables shown above.
3. Shade in the % Daily Value for this nutrient on each % Daily Value scale shown above.
4. What do you want to do with the nutrient you have circled?

   ❑ I want to get less of this nutrient. (Hint: Choose packaged foods with a low % Daily Value.)

   ❑ I want to get more of this nutrient. (Hint: Choose packaged foods with a high % Daily Value.)

5. Which food is the better choice for you?

   ❑ Food A - Why?_____

   ❑ Food B - Why?_____

Serve it up or serve it down!

If you eat the serving size shown on the Nutrition Facts table, you will get the amount of calories and nutrients that are listed.

What happens if you eat LESS or MORE than the serving size shown?

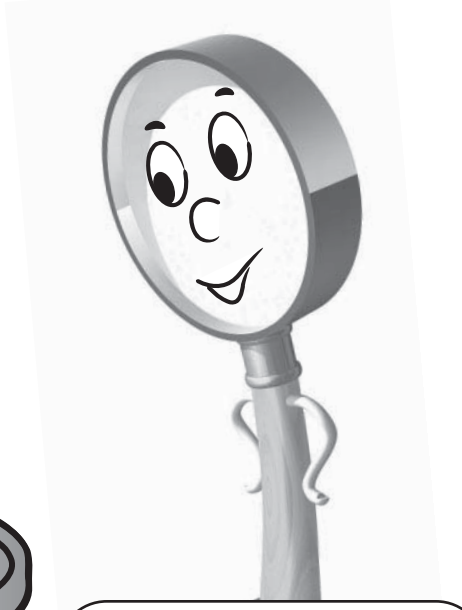
1. Choose one packaged food.
2. Choose a nutrient on the Nutrition Facts table that is important to you. Write the name of this nutrient on the chart shown below.
3. Write the serving size, Calories and % Daily Value (or g/mg) shown on your package in the "Serving size on the package" column on the chart.
4. Fill in the new serving size, Calories and % Daily Value (or g/mg) for "Half a serving" and for a "Double serving" on the chart.
5. Which serving size is the best choice for you? Why?

Nutrient _____	**Serving size on the package**	**Half a serving** (Hint: Divide by 2)	**Double serving** (Hint: Multiply by 2)
Serving size	_____	_____	_____
Calories	_____	_____	_____
% Daily Value	_____%	_____%	_____%
Amount in g or mg	_____g or mg	_____g or mg	_____g or mg

Look at the label

Nutrition information on food labels...

- Helps you make informed food choices
- Helps you follow Canada's Food Guide
- Is required on most packaged foods
- Is based on Health Canada's regulations

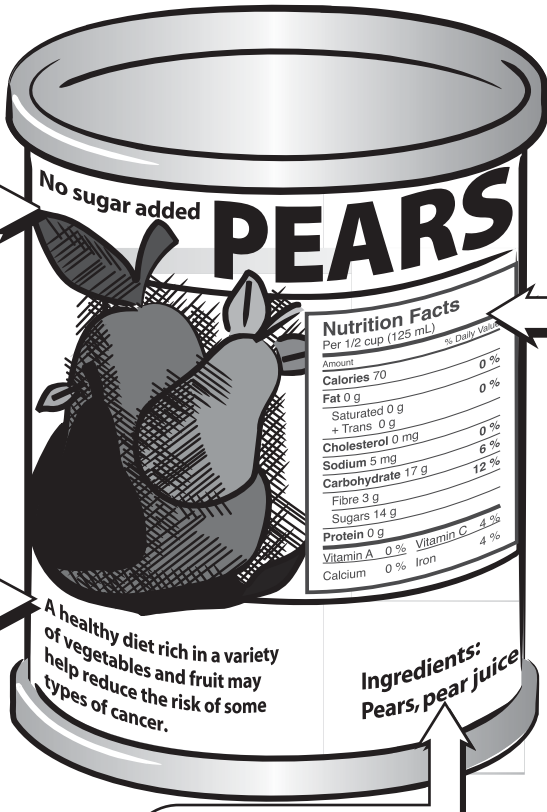


Nutrition claims

There are two types of nutrition claims:

1 **Nutrient content claim** tell you about one nutrient such as sodium, fat or sugar.

2 **Health claims** tell you how your diet can affect your health.



Nutrition Facts table

provides you with information on the Calories and 13 nutrients for the serving size shown.

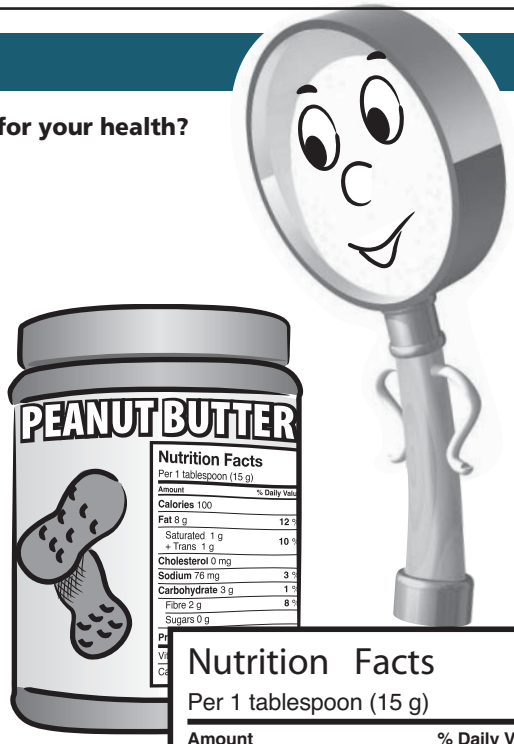
Nutrition Facts			
Per 1/2 cup (125 mL)			
Amount	**% Daily Value**		
Calories 70			
Fat 0 g	**0** %		
Saturated 0 g + Trans 0 g	**0** %		
Cholesterol 0 mg			
Sodium 5 mg	**0** %		
Carbohydrate 17 g	**6** %		
Fibre 3 g	**12** %		
Sugars 14 g			
Protein 0 g			
Vitamin A	0 %	Vitamin C	4 %
Calcium	0 %	Iron	4 %

Ingredient list

The ingredient list tells you what ingredients are in a packaged food.

All about nutrients

Why are the nutrients on the Nutrition Facts table important for your health?



Fat

Fat provides energy and nutrients for your body. However, if you eat too much fat or too much of certain kinds of fat, such as saturated fat and trans fat, you could develop heart disease or type 2 diabetes.

Cholesterol

Your body makes most of its own cholesterol, but also gets some cholesterol from foods that you eat. Cholesterol builds the cells and hormones in your body. Too much cholesterol in your blood can lead to heart attacks or strokes.

Sodium

Sodium is another name for salt. Salt helps to balance the fluids in your body, but for some people, eating too much salt may be harmful.

Carbohydrate

Carbohydrate provides energy for your muscles and your brain. Sugar and fibre are two types of carbohydrate shown on the Nutrition Facts table.

If you have diabetes, you can help control your blood glucose by:
- Dividing carbohydrate evenly into meals and snacks throughout the day
- Eating foods high in fibre

Nutrition Facts	
Per 1 tablespoon (15 g)	
Amount	**% Daily Value**
Calories 100	
Fat 8 g	**12** %
Saturated 1 g + Trans 1 g	**10** %
Cholesterol 0 mg	
Sodium 76 mg	**3** %
Carbohydrate 3 g	**1** %
Fibre 2 g	**8** %
Sugars 0 g	
Protein 4 g	
Vitamin A 0 %	Vitamin C 0 %
Calcium 1 %	Iron 0 %

Protein

Protein builds your muscles, bones and teeth.

Vitamins

Vitamin A keeps your skin and eyesight healthy. Vitamin C helps your body fight infections.

Minerals

Calcium gives you strong bones and teeth and may prevent osteoporosis. Iron helps your red blood cells carry oxygen throughout your body.

Eat a variety of foods to get the nutrients your body needs.

Take 5 to read the facts

Got 5 minutes? Follow these easy steps to read the Nutrition Facts table.

1 Serving

If you eat the serving size shown on the Nutrition Facts table, you will get the amount of Calories and nutrients that are listed. Always compare the serving size on the package to the amount that you eat.

2 Calories

Calories tell you how much energy you get from one serving of a packaged food.

3 Percent Daily Value (% Daily Value)

% Daily Value puts nutrients on a scale from 0% to 100%. This scale tells you if there is a little or a lot of a nutrient in one serving of a packaged food.

4 Get less of these nutients

- Fat, saturated fat and trans fat
- Cholesterol
- Sodium

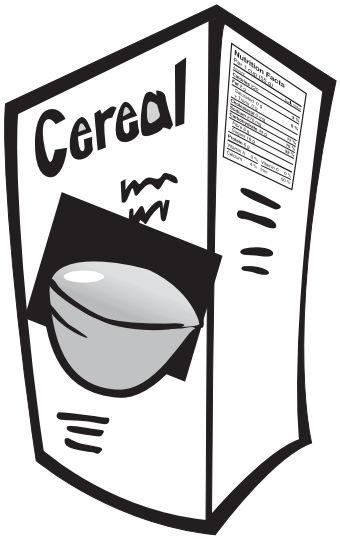
Choose packaged foods with a low % Daily Value of fat and sodium, especially if you are at risk for heart disease or diabetes.

Nutrition Facts	
Per 1 cup (55 g)	
Amount	**% Daily Value**
Calories 220	
Fat 2 g	**3** %
Saturated 0 g + Trans 0 g	**0** %
Cholesterol 0 mg	
Sodium 270 mg	**11** %
Carbohydrate 44 g	**15** %
Fibre 8 g	**32** %
Sugars 16 g	
Protein 6 g	
Vitamin A 0 %	Vitamin C 0 %
Calcium 4 %	Iron 40 %

5 Get more of these nutrients

- Fibre
- Vitamin A and Vitamin C
- Calcium
- Iron

Choose packaged foods with a high % Daily Value of these nutrients. If you have diabetes, watch how much carbohydrate you eat as this will affect your blood glucose levels.

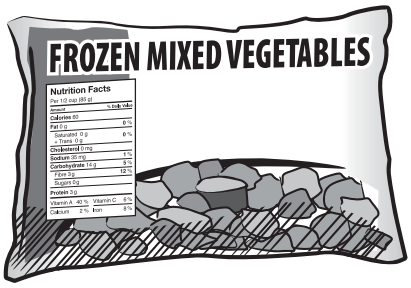


Using percent Daily Value (% Daily Value)

Use % Daily Value to find out if there is a *little* of or a *lot* of a nutrient in one serving of a packaged food.

What is percent % Daily Value?

% Daily Value puts nutrients on a scale from 0% to 100%. This scale tells you if there is a *little* or a *lot* of a nutrient in one serving of a packaged food.



What is a little? What is a lot?

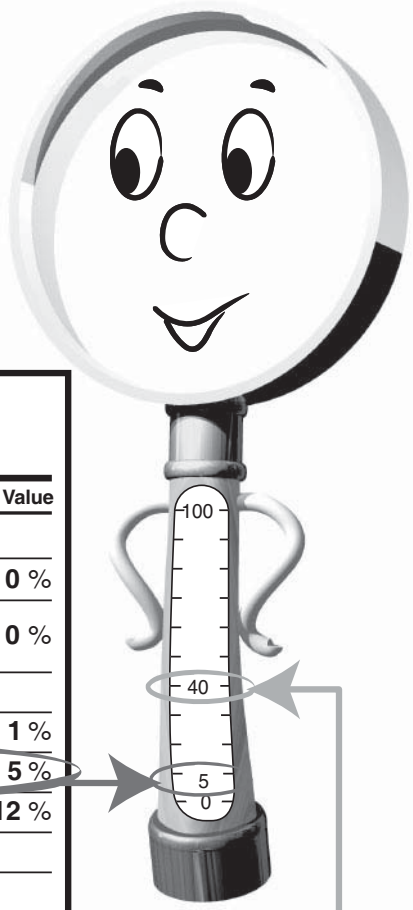
Let's look at the % Daily Value on the Nutrition Facts table for this package of vegetables:

- One serving has 5% Daily Value for carbohydrate. This is a little because it is low on the scale.
- One serving has 40% Daily Value for Vitamin A. This is a lot because it is high on the scale.

Nutrition Facts

Per 1/2 cup (85 g)

Amount	% Daily Value
Calories 60	
Fat 0 g	**0** %
Saturated 0 g + Trans 0 g	**0** %
Cholesterol 0 mg	
Sodium 35 mg	**1** %
Carbohydrate 14 g	**5** %
Fibre 3 g	**12** %
Sugars 0 g	
Protein 3 g	
Vitamin A 40 %	Vitamin C 6 %
Calcium 2 %	Iron 8 %



Make healthy food choices by using % Daily Value.

Serving up nutrition facts

Why is the serving size on packaged foods important?

The serving size tells you how much food you need to eat to get the amount of Calories and nutrients shown on the Nutrition Facts table.

How is the serving size shown on the Nutrition Facts label?

There are two types of information that tell you about the serving size:

- **Household measurements**
  Look for familiar words like cup and pieces
- **Metric measurements**
  Look for metric measurements like mL (millilitres) and g (grams).

What if you eat less? What if you eat more?

If you eat less than the serving size shown on the Nutrition Facts table you will get less of the Calories and nutrients listed. If you eat more than the serving size shown, you will get more of the Calories and nutrients listed.

In this example, if you eat a double serving of this cereal, you will get double the Calories and double of all the nutrients, such as fibre.

Single serving

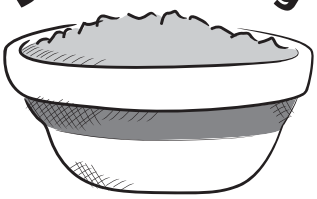
Nutrition Facts

Per 1 cup (55 g)

Amount	% Daily Value
Calories 220	
Fat 2 g	**3** %
Saturated 0 g + Trans 0 g	**0** %
Cholesterol 0 mg	
Sodium 270 mg	**11** %
Carbohydrate 44 g	**15** %
Fibre 8 g	**32** %
Sugars 16 g	
Protein 6 g	

Vitamin A	0 %	Vitamin C	0 %
Calcium	4 %	Iron	40 %

Double serving



Nutrition Facts

Per 2 cups (110 g)

Calories 440

64 %

International Food Guides

A Comparison Exercise

USA Food Pyramid

Click image to start animation

http://www.mypyramid.gov/downloads/animation/Presentation_English.wmv

Japan

http://www.mhlw.go.jp/bunya/kenkou/pdf/eiyou-syokuji5.pdf

Korea

http://www.senba.es/recursos/piramides/pictorials_nutrition_guides.pdf

Philippines

http://www.fnri.dost.gov.ph/files/fnri%20files/pyramidguide/pyramid6.jpg

Sweden

The Food Circle

http://www.slv.se/upload/nfa/documents/food_nutrition/The%20Food%20Circle.pdf

Great Britain

http://www.eatwell.gov.uk/healthydiet/eatwellplate/

Portugal

http://www.gastronomias.com/roda-alimentos/

Greece

http://www.mamashealth.com/nutrition/medpyramid.asp

How do the various food guides compare to Canada's Food Guide to Healthy Eating?

What factors contribute to the variations seen between countries?

Estimated time required 5 75 minute classes

Overall expectations

By the end of these activities, the students will be able to:

- understand new Canadian food-labelling laws
- understand how the Canadian Food Inspection Agency (CFIA) functions and what kind of food recalls the agency has conducted over the last two years
- recognize the various aspects of food storage, distribution and safety in North America
- investigate opposite sides of a controversial food issue

Enduring understandings

Students will understand the complexity and challenges involved in ensuring a safe food system.

Prior Learning

These activities can be adapted to stand alone or be used in conjunction with the other lessons in this unit.

Getting Ready

Duplicate the black line masters for students:

Lesson 1: BLM 1B-1 Where Do Canadian Pineapples Grow?
Lessons 2&3: BLM 1B-2 CFIA Graph
BLM 1B-3A CFIA data 2007
BLM 1B-3B CFIA data 2008
BLM 1B-4 Food Inspectors at Work
Lesoon 4: BLM 1B-7 Is Your Food Contaminated?
Lessons 5: BLM 1B-8 Milking the Issue

Photocopy and make into jigsaw puzzle.

Lesson 4: BLM 1B-5, Puzzle Template, and BLM 1B-6, Food Safety Chain

An answer key for Lessons 2 & 3 may be found immediately following the relevant BLMs.

Teaching & learning strategies—Lesson 1

Background Information

Previous Canadian labelling laws stated that if at least 51% of the value of the product was Canadian (this included packaging etc.), then a product could be labelled "Product of Canada". New Canadian food-labelling laws state that a "Product of Canada" label may only be used if 98% or more of the product is from Canadian sources. Manufacturers may voluntarily choose/not choose to use this label.

A "Made in Canada" label is more complicated. If some components of the product are Canadian (less than 98%) and some are imported, then the label must state "Made in Canada from Imported and Domestic Ingredients." However, this label does not have to show the origin of the imported ingredients. Although the new laws have been in place since January, 1, 2009, it is unlikely that we will see complete changes in the marketplace for one full year—it takes this long for processed food to make it through the system. [1]

1. Prior to the class, ask students to bring in one piece of food packaging (this may be a product from home or something that they have pu chased consumed at school).
2. Use a KWL chart to assess how much students know about food labelling. Ask students: What do you know and want to know about food labelling in Canada? Post this chart in a visible spot in the classroom.
3. Ask students to look at each of their labels and interpret the components. Ask students if they know what a "Product of Canada" and/or a "Made in Canada" label indicates.
4. Once students have discussed their labels, tell them about the new laws. Show them the overhead, BLM 1B-1 Where do Canadian Pineapples Grow?, and ask them why they think this manufacturer was able to label its juice "Product of Canada." *[Answer: The label fell under pre-2009 laws]*. Ask students why the label was misleading to consumers.
   Ask them what a new label would look like—what information may/may not be included on it?
5. Show students a thirty-minute episode of CBC's Marketplace ("Product of Canada, Eh?")[2]. The show can be streamed into the classroom if you have internet access and a digital projector. *http://www.cbc.ca/marketplace/product_of_canada_eh/*
6. Instead of or in addition to the "Product of Canada, Eh?" episode, you may wish to show the concise, nine-minute follow-up: "Busted: Product of Canada Update"[3]. This may also be streamed into the classroom from the following link: *http://www.cbc.ca/marketplace/2009/vehicle_history_reports/busted.html*
7. Return to the KWL chart and fill in the last column with what students now know about food labelling in Canada.

Sources:

1 Celli, R. (2009, January 22). Product of Canada. Retrieved January, 27, 2009 from http://www.cbc.ca/ontariotoday/story_archive.html

2 Fowler, J. (Producer). (2007, October 24). Product of Canada, Eh? Retrieved January 27, 2009, from http://www.cbc.ca/marketplace/product_of_canada_eh/

3 CBC Marketplace. (2009, January 16). Busted: Product of Canada Update: Do New Food Label Laws Go Far Enough? Retrieved January 27, 2009, from http://www.cbc.ca/marketplace/2009/vehicle_history_reports/busted.html

Teaching and learning strategies—Lesson 2 & 3

Background information

In May, 2008, the University of Regina surveyed 17 industrial countries and announced that Canada had ranked fifth in food safety, earning it a "superior" rating. The United Kingdom ranked number one, followed by Japan, Denmark and Australia; the United States ranked seventh. This survey was based on 45 indicators, including hygiene practices, food inspection (of imports, restaurants, food retailers, distributors and processors), food recall procedures and consumer education. Canada excels in governance and recall procedures; however, its weak areas include supply chain traceability and biosecurity issues, especially those related to food labelling and use of pesticides.[1,2]

At the federal level, Health Canada creates policies and standards related to the safety and nutritional quality of food sold in the country. The Canadian Food Inspection Agency (CFIA) helps the government to enforce these policies and standards, in order to protect Canadians.[3]

1. Divide the class into groups of approximately four students each. Give each student a copy of BLM 1B-2 (CFIA GRAPH) or your own graph paper. Half of each group will be responsible for 2007 data—give these students copies of BLM 1B-3A (2007 CFIA data). The other half of the group will be responsible for 2008 data—give these students copies of BLM 3b (2008 CFIA data).
2. Ask students to use tallied data to compile stacked bar graphs. In order to make graphing (and marking of graphs) easier, each group member should be responsible for the following:

- Student 1 will create a graph entitled "CFIA Food Recalls by Month (2007)" and Student 2 will create a graph entitled "CFIA Recalls by Month (2008)".
- For both students: Create a stacked bar graph by labelling the x-axis with "Months" (two-block width for each month) and the y-axis with the "Number of Recalls" (using a scale of 1-30 with each block representing 1). Students will create a stacked bar for each month, using each of the food recall sub-categories (Eggs, Milk, Nuts…Botulism, E. coli…) within the stack. Stacked bars should follow the same order of recall categories from bottom to top. In the case where a category indicates "0", it is not included in the stack. Students should create a legend which shows the colour of each of the twelve recall categories.
- Student 3 will create a graph entitled "CFIA Food Recalls By Category (2007)" and Student 4 will create a graph entitled "CFIA Food recalls By Category (2008)".
- For both students: Create a stacked bar graph by labelling the x-axis with "Food Recall Categories" (two-block width for each category) and the y-axis with the "Number of Recalls" (using a scale of 1-64 with each block representing 2). Students will create a stacked bar for each recall category, using monthly sub-categories within the stack Stacked bars should follow the same order of months from bottom to top. In the case where no data is recorded during the month, the month is not included in the stack. Students should create a legend which shows the colour of each of the months.

3. Once students have completed all graphs, hand out one copy of BLM 1B-4 (Food Inspectors at Work) to each group. Ask the group members to examine their data sheets/graphs in order to come up with appropriate responses.

An answer key is provided for all four graphs and for BLM 1B-4 questions immediately following the BLMs for this lesson. Teachers may wish to photocopy graphs onto acetates, to facilitate marking of student accuracy.

Extension Activities

1. Research one of the food recall subcategories or find an internet newspaper article in which the subcategory is referenced. Describe the allergy or food-related illness. Find out how frequently it is detected in Canada or in other countries. What

are the health problems connected to this allergy or food-related illness? In Canada, have recalls been associated with certain companies? How have these companies addressed public concerns?

2. Students who wish to learn more about a career as a food inspector may choose to view video clips giving profiles of three young CFIA inspectors[4]: *http://www.inspection.gc.ca/english/hrrh/carcare.shtml*
   Follow the links: Types of Careers ->Opportunities on the Front Line ->Inspectors->Education-> click on Video Profile of your choice
3. Students who wish to learn more about the process of food recalls may wish to read background information at the following site[5]: *http://www.inspection.gc.ca/english/fssa/recarapp/systeme.shtml*

Sources:
1 Sharon Oosthoek. "Canada's food safety ranking surprises researchers" CBC News.ca, http://www.cbc.ca/consumer/story/2008/05/21/foodsafety.html (accessed 28 January, 2009).

2 University of Regina News and Events, "U of R professors rank Canada fifth out of 17 industrialized countries in international food safety study," http://www.uregina.ca/news/newsreleases.php?release=472 (accessed 28 January, 2009).

4 Canadian Food Inspection Agency, "Career Profiles," http://www.inspection.gc.ca/english/hrrh/carcare.shtml (accessed 28 January, 2009).

3,5 Canadian Food Inspection Agency, "The Canadian Food Safety System—Food Recall," http://www.inspection.gc.ca/english/fssa/recarapp/systeme.shtml (accessed 28 January, 2009).

Teaching & Learning Strategies—Lesson 4

1. Prepare enough food safety "jigsaw puzzles" for students in your class. Students can work in groups of three or four. For each puzzle, make a copy of BLM 5 (Puzzle Template) and BLM 6 (Food Safety Chain)[1]. BLM 5 should be copied onto card stock, if possible. Paste a copy of the template onto the back of BLM 6 and cut out the pieces. Give a puzzle to each group and ask it to fit the pieces together.
2. Ask students to describe what they see in the completed puzzle and ask them if they realized that our food system is so complex.
3. Allow students to listen to the podcast "Is Your Food Contaminated…?"[2] The first ten minutes of the podcast includes an interview with Mark Fischetti, editor of Scientific American, discussing American concerns with food distribution and food safety. After listening to the podcast, you may wish to discuss some of the "cutting edge" food safety technology, that may be available to *us in the future. Link to podcast: http://www.sciam.com/podcast/episode.cfm?id=6A169DDC-E7F2-99DF-3C128D97D3836F3F*

Sources:
1 Steve Mirsky, "Is Your Food Contaminated? New Approaches are Needed to Protect the Food Supply," Scientific American, September, 2007, 114.

2 Steve Mirsky, "Is Your Food Contaminated? New Orleans Now; The Science of Dogs," Science Talk (15 August, 2007), Podcast retrieved from http://www.sciam.com/podcast/episode.cfm?id=6A169DDC-E7F2-99DF-3C128D97D3836F3F (accessed 28 January, 2009)

Teaching and learning strategies—Lesson 5

1. Ask students to read BLM 1B-8 (Milking the Issue) and to share their initial reaction to the opposing views. Is there a side that they feel they support?
2. Ask students to research more background information on the case. A number of activities may follow:

a) have a class debate on the issue

b) discuss whether information presented in this case, by the media, is biased. [The teacher may want to use supporting material from The Media Awareness Network (*http://www.media-awareness.ca*), which has a lesson on "How to Analyze the News." Once at the website, enter "How to Analyze the News" in the Search box and the lesson link will be displayed.]

c) research the outcome of Michael Schmidt's trial in January, 2009. Regardless of whether they support or don't support the outcome, students can write a letter to their MP's or MPP's, expressing their views on the issue.

d) make a stakeholders chart—who has vested interest in each side? Create a role play and script involving a meeting of these people on the steps of the provincial legislature.

e) Investigate three alternative kinds of agriculture: Biodynamic Agriculture (which Michael Schmidt follows), Agroecology and Permaculture. Background information on Permaculture may be found in the "Future of Food" section of this resource document. Prepare a three-ringed Venn diagram to compare and contrast these systems.

f) Research and do a report on the history/importance of pasteurization.

Where do pineapples grow?

SERVE CHILLED
REFRIGERATE
AFTER OPENING
SHAKE WELL

NO PRESERVATIVES

100% FRUIT,
100% PURE,
100% FLAVOURFUL

Nutrition Facts
Per 250 mL

Amount	% DV*
Calories 120	
Fat 0 g	0 %
Saturated 0 g + Trans 0 g	0 %
Cholesterol 0 mg	
Sodium 20 mg	1 %
Carbohydrate 29 g	10 %
Fibre 0 g	0 %
Sugars 27 g	
Protein 0.5 g	
Vitamin A	0 %
Vitamin C	100 %
Calcium	4 %
Iron	4 %

* DV = Daily Value

** Natural fruit sugars

INGREDIENTS: WATER, CONCENTRATED PINEAPPLE JUICE, VITAMIN C.

PRODUCT DU CANADA
PRODUCT OF CANADA

CFIA Graph

Canadian Food Inspection Agency (CFIA) Data 2007

CATEGORY 1

Use the following data to construct your stacked bar graphs.

CATEGORY 1: Allergy Alert

Month	Egg	Milk	Nuts (including sesame)	Soy	Sulphites	Other(1)*
January	1	0	3	1	1	0
February	3	3	1	0	0	0
March	6	5	3	3	0	0
April	5	2	0	0	0	0
May	0	4	0	1	0	0
June	0	2	1	0	0	0
July	0	0	1	0	0	0
August	0	1	1	0	0	0
September	0	1	0	0	1	0
October	0	5	0	0	0	0
November	0	4	0	0	0	0
December	0	1	1	0	0	0

* Other includes wheat and fish

Canadian Food Inspection Agency (CFIA) Data 2007

CATEGORY 2

Use the following data to construct your stacked bar graphs.

CATEGORY 2: Health Hazard Alert/Consumer Advisory/Safety Alert/News Release/Investigation/Recall

Month	Clostridium botulinum (botulism)	E. coli	Listeria	Melamine	Salmonella bacteria	Other(2)*
January	1	0	0	0	0	0
February	0	0	0	0	3	2
March	3	0	0	0	4	5
April	0	0	0	0	2	0
May	0	0	0	0	4	3
June	1	0	0	0	7	0
July	2	2	0	0	5	2
August	2	0	0	0	3	5
September	0	1	1	0	1	0
October	0	2	0	0	1	0
November	0	7	1	0	0	2
December	0	0	0	0	1	1

* Other includes arsenic, Bacillus cereus, choking hazard, false labelling, glass, high level of nutrients, Nitrofurans, paralytic shellfish toxin, pathogenic bacteria, plastic, rancidity, rupture, Shigella bacteria, Staphylococcus bacteria, tampering, unknown cause of illness, Vibriosis

Canadian Food Inspection Agency (CFIA) Data 2008

Use the following data to construct your stacked bar graphs.

CATEGORY 1: Allergy Alert

Month	Egg	Milk	Nuts (including sesame)	Soy	Sulphites	Other(1)*
January	0	0	0	2	0	0
February	1	1	0	0	0	1
March	0	0	1	2	0	0
April	2	0	0	0	0	0
May	0	0	2	0	0	0
June	0	0	0	0	1	0
July	3	4	0	0	0	0
August	0	1	0	0	0	0
September	1	2	0	0	0	0
October	0	0	1	0	2	1
November	1	3	0	0	2	0
December	0	6	0	0	0	0

* Other includes wheat and fish

Canadian Food Inspection Agency (CFIA) Data 2008

CATEGORY 2

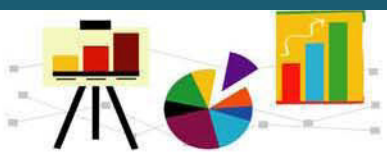
Use the following data to construct your stacked bar graphs.

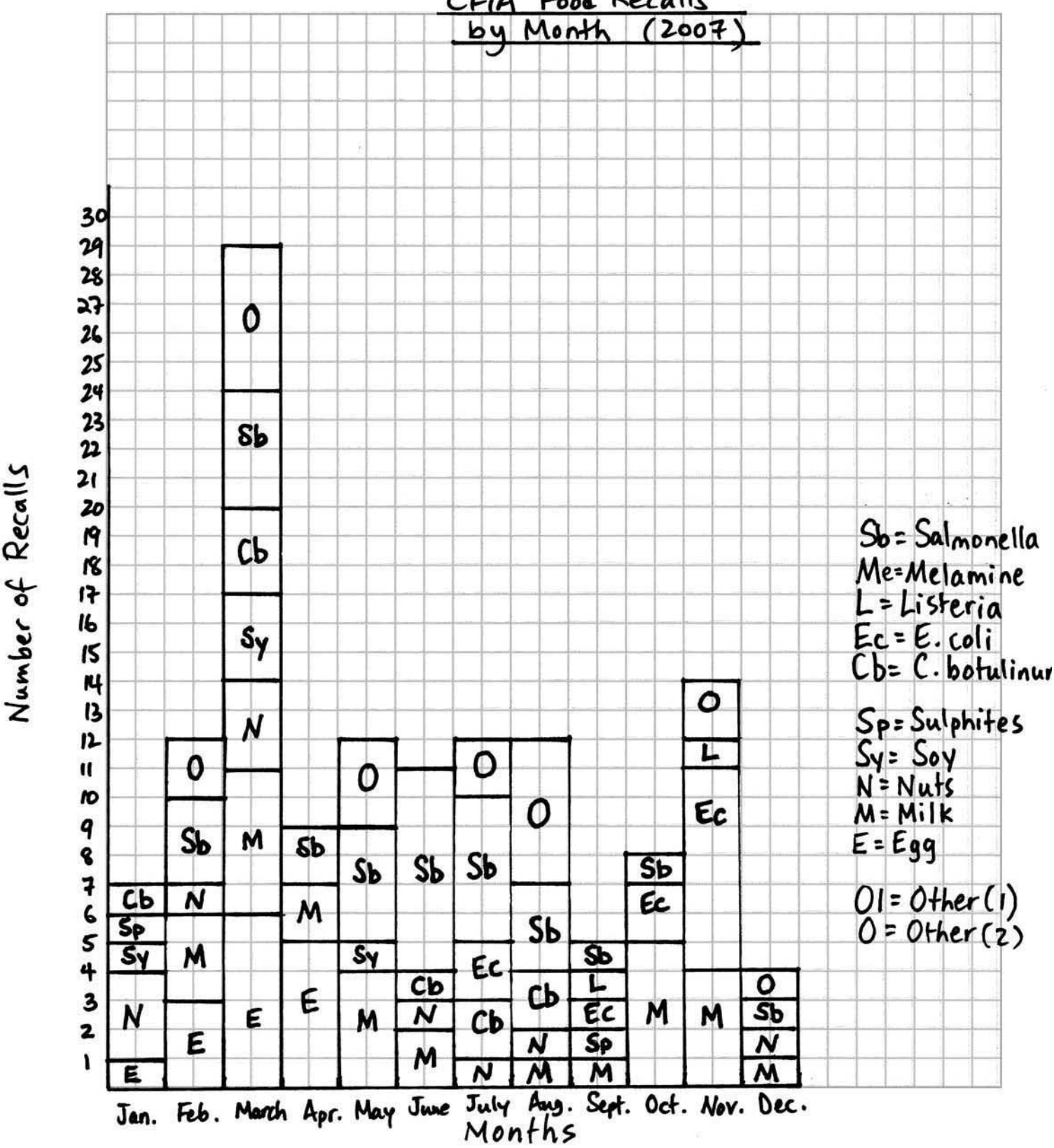
CATEGORY 2: Health Hazard Alert/Consumer Advisory/Safety Alert/News Release/Investigation/Recall

Month	Clostridium botulinum (botulism)	E. coli	Listeria	Melamine	Salmonella bacteria	Other(2)*
January	0	0	1	0	1	1
February	1	0	0	0	3	0
March	0	0	0	0	5	2
April	0	0	0	0	1	0
May	0	3	2	0	0	0
June	0	0	0	0	3	0
July	0	0	0	0	6	0
August	0	1	25	0	1	0
September	0	0	13	6	1	1
October	0	1	9	3	1	2
November	0	0	1	0	1	1
December	0	0	10	0	0	3

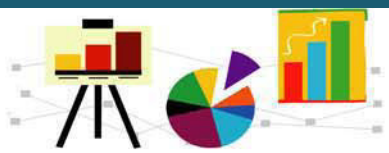
* Other includes arsenic, Bacillus cereus, choking hazard, false labelling, glass, high level of nutrients, Nitrofurans, paralytic shellfish toxin, pathogenic bacteria, plastic, rancidity, rupture, Shigella bacteria, Staphylococcus bacteria, tampering, unknown cause of illness, Vibriosis

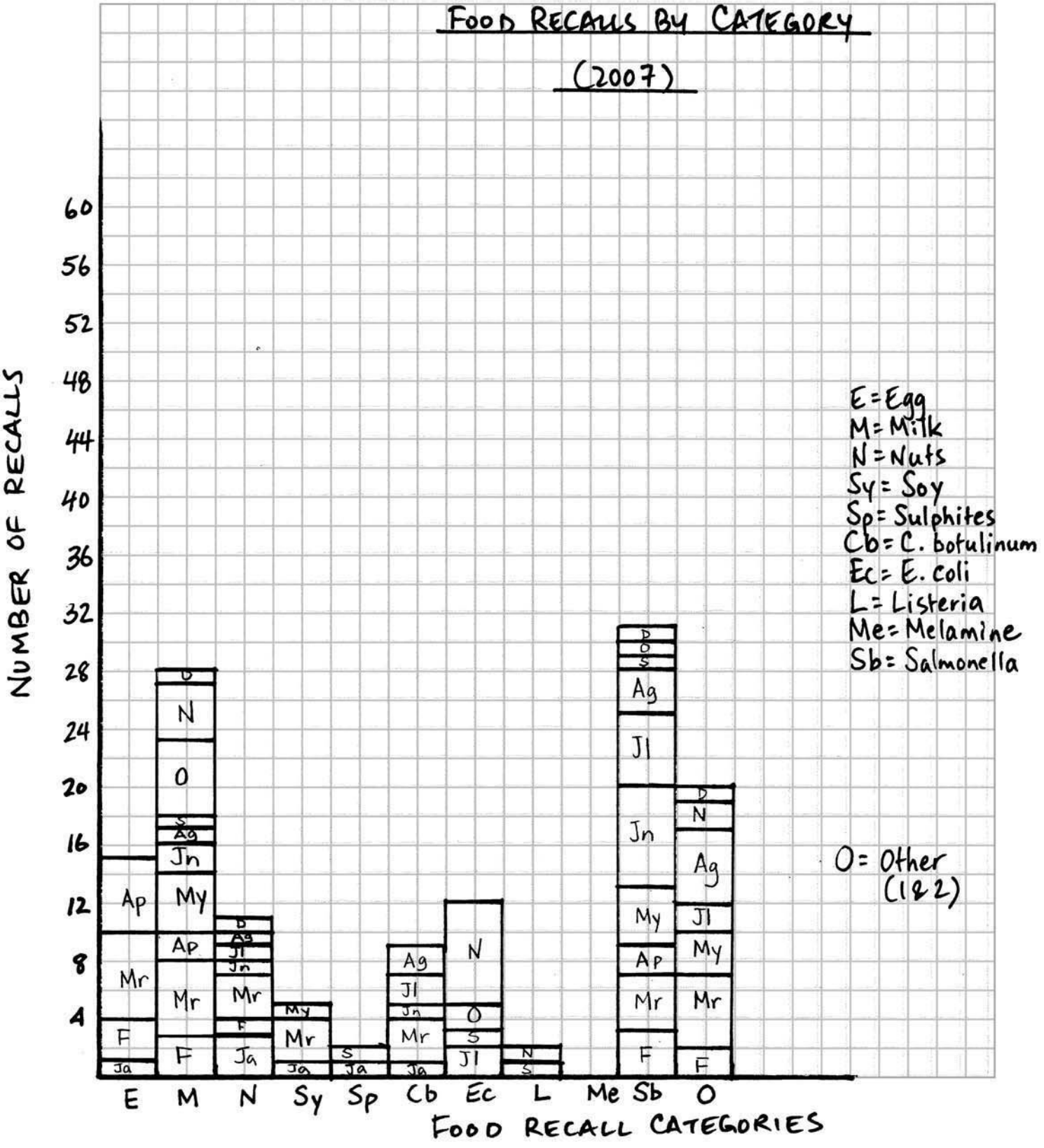
Food Recalls by Month—2007—Solutions



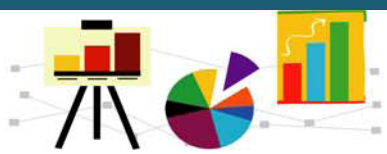


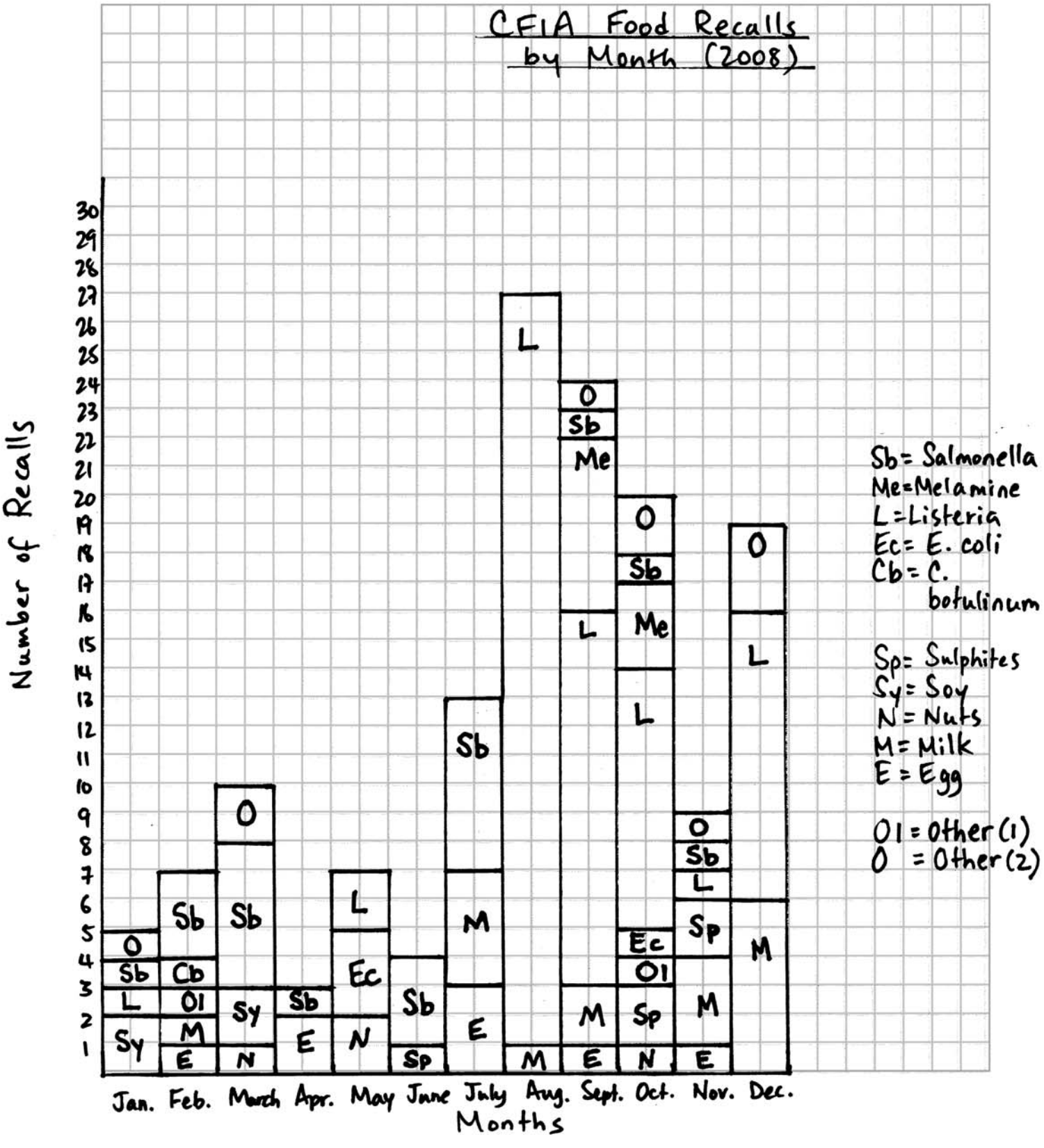
Food Recalls by Category—2007—Solutions



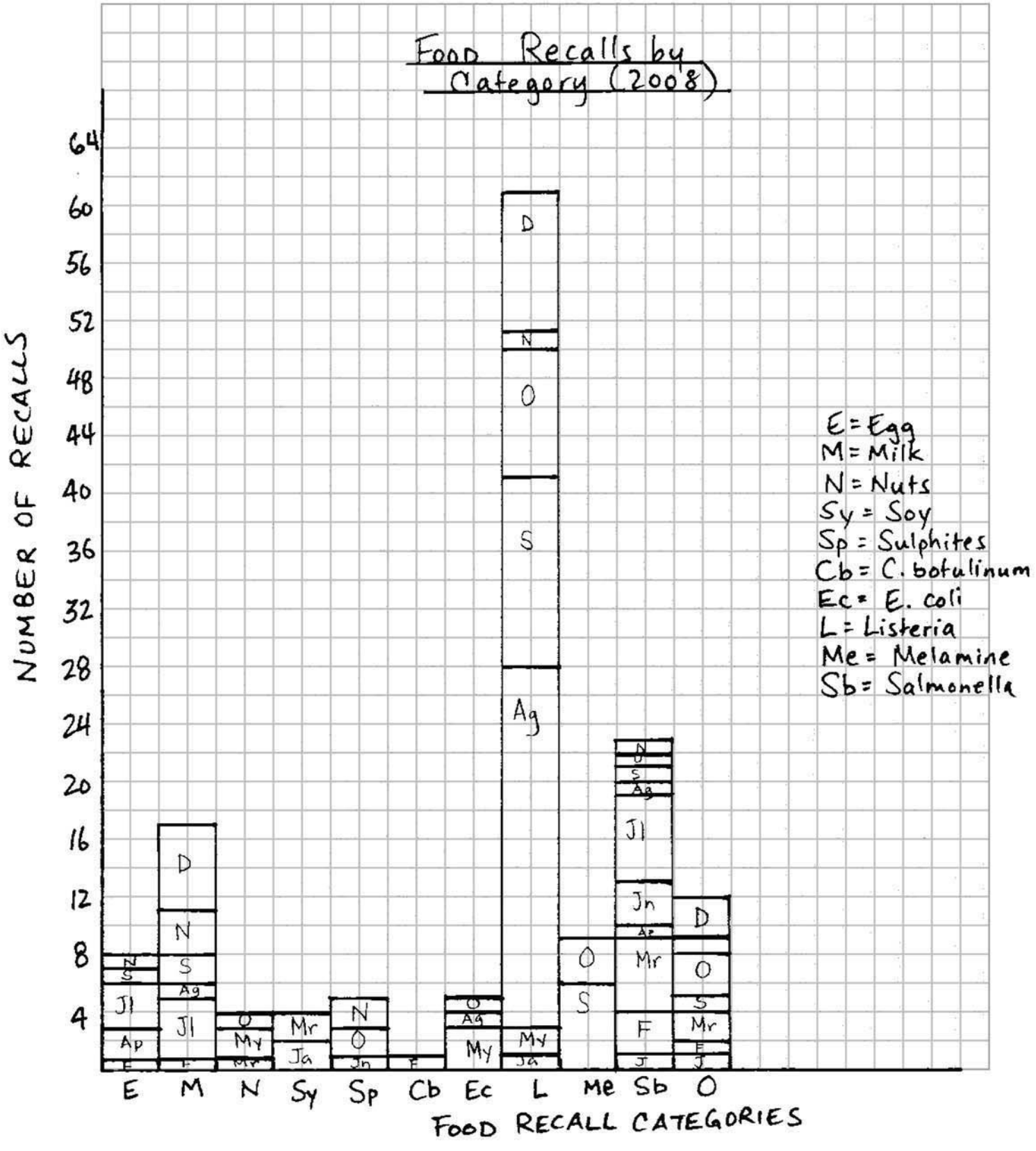


Food Recalls by Month—2008—Solutions





Food Recalls by Category—2008—Solutions



Food Inspectors at Work

Now that your group has transformed data from the CFIA website, use your four graphs to answer the following questions:

1. In which month/year was the highest number of total recalls? How many recalls were there?
2. In which month/year was there the lowest number of total recalls? How many recalls were there?
3. In each of 2007 and 2008, were there more Category 1 or Category 2 recalls?
4. In 2007, which three sub-categories (from both Categories 1 & 2) had the most recalls (do not include the "Other" category)? How many recalls were there for each of these sub-categories?
5. In 2008, which three sub-categories (from both Categories 1 & 2) had the most recalls (do not include the "Other" category)? How many recalls were there for each of these sub-categories?
6. Which year had the most overall recalls? How many types of food were recalled in this year? Was there a big difference in the number of recalls between 2007 and 2008?
7. From your recollection of past news reports, can you name four examples of foods that have been recalled?
8. Which sub-category did not have any recalls in 2007, but became a problem in 2008? What kinds of foods do you think were associated with this hazard? Which country, in particular, was connected to this hazard?
9. From your "#Recalls versus Months" graphs, do you see any patterns indicating when food recalls are the highest? Try to explain why you do or do not see any patterns.
10. What do you think government/companies can do to help reduce the number of food recalls throughout the year?
11. After learning about food recalls and food inspection, do you think you will change the kinds of food that you buy or the places where you buy your food? Why or why not?

Food Inspectors at Work—Solutions

1. In which month/year was the highest number of total recalls? How many recalls were there?
   March, 2007, had 29 recalls.

2. In which month/year was there the lowest number of total recalls? How many recalls were there?
   April, 2008, had 3 recalls.

3. In each of 2007 and 2008, were there more Category 1 or Category 2 recalls?
   Both years had more Category #2 recalls.

4. In 2007, which three sub-categories (from both Categories 1 & 2) had the most recalls? (Do not include the "Other" category). How many recalls were there for each of these sub-categories?
   Salmonella bacteria (31), Milk (28) and Eggs (15)

5. In 2008, which three sub-categories (from both Categories 1 & 2) had the most recalls (do not include the "Other" category)? How many recalls were there for each of these sub-categories?
   Listeria (61), Salmonella bacteria (23) and Milk (17)

6. Which year had the most overall recalls? How many types of food were recalled in this year? Was there a big difference in the number of recalls between 2007 and 2008?
   2008 (145)—not a big difference between years (2007 was 135)

7. From your recollection of past news reports, can you name four examples of foods that have been recalled?
   Many different kinds of processed foods, chocolates, fruit and vegetables, luncheon meats, infant formula

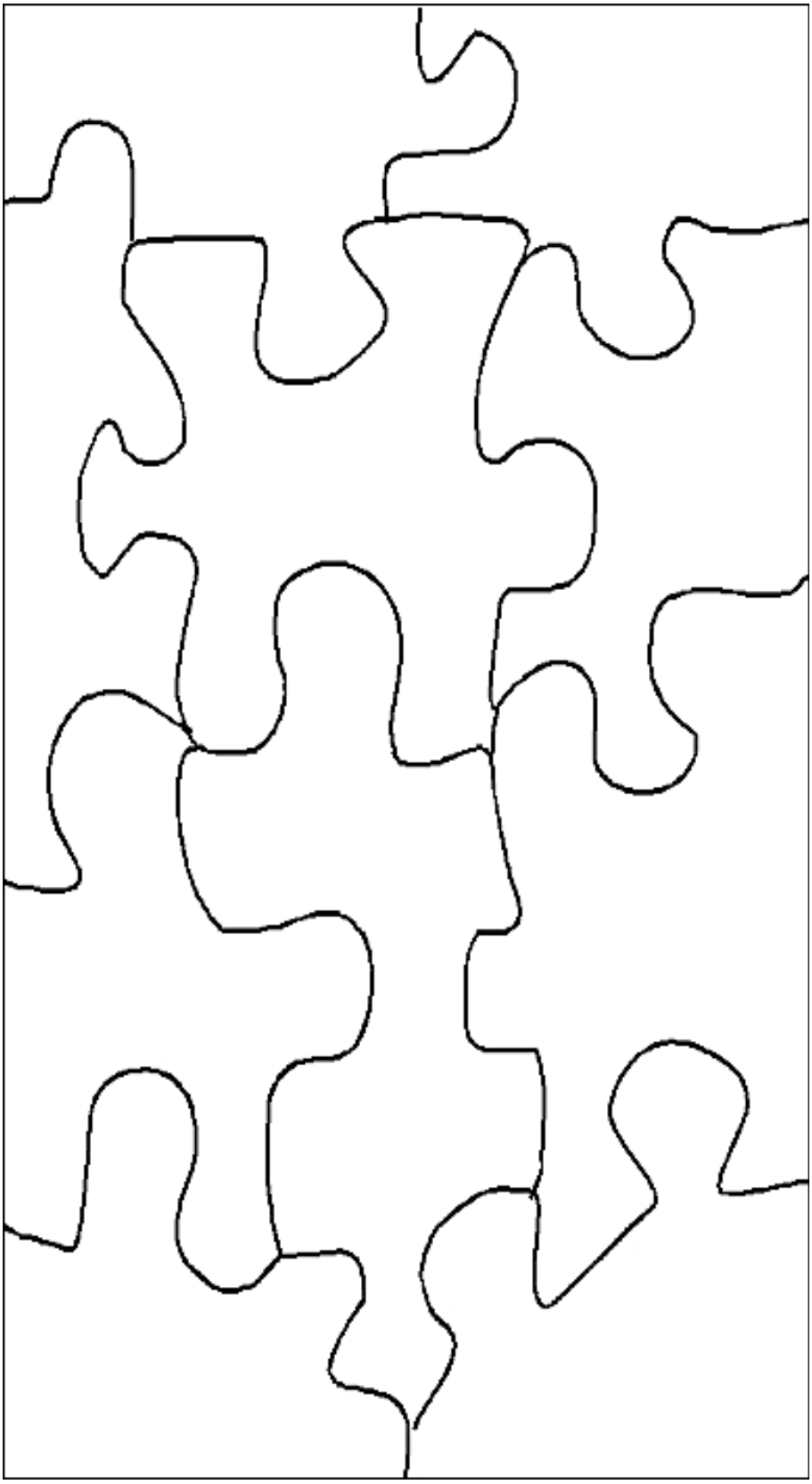
8. Which sub-category did not have any recalls in 2007, but became a problem in 2008? What kinds of foods do you think were associated with this hazard? Which country, in particular, was connected to this hazard?
   Melamine—infant formula, China

9. From your "#Recalls versus Months" graphs, do you see any patterns indicating when food recalls are the highest? Try to explain why you do or do not see any patterns.
   No pattern obvious—2007 fairly consistent throughout year; 2008 more cases from summer onwards—numbers may have to do with awareness levels, better testing, appropriate/inappropriate food handling procedures.

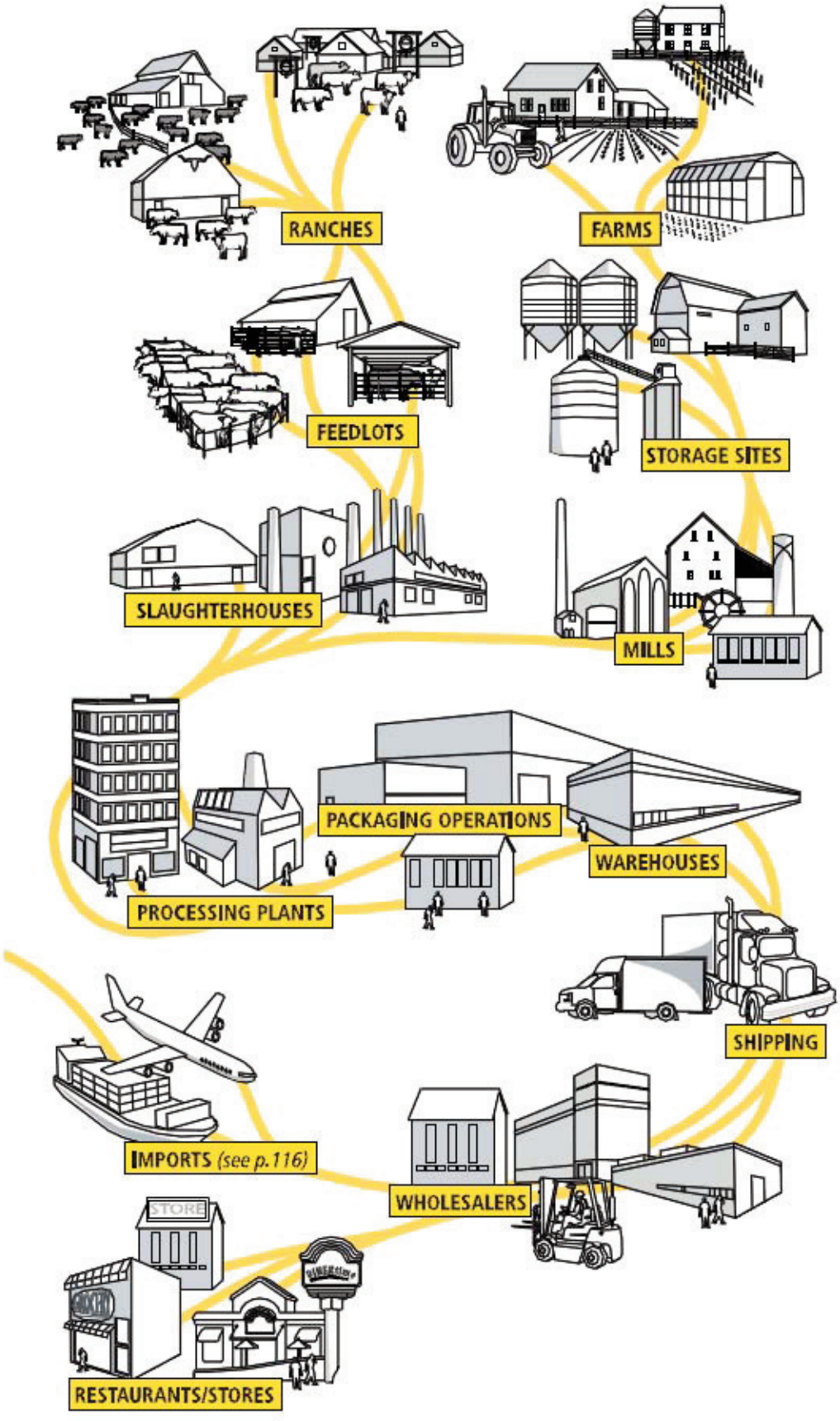
10. What do you think government/companies can do to help reduce the number of food recalls throughout the year?
    governments—more inspectors, improved testing (frequency and quality), improved labelling on processed foods, demanding more transparent and reliable distribution chains; companies—improved food handling/sanitation practices in food-processing plants, more inspections

11. After learning about food recalls and food inspection, do you think you will change the kinds of food that you buy or the places where you buy your food? Why or why not?

Puzzle Template



Food Safety Chain



Milking the Issue—The Raw vs. Pasteurized Debate

Background

Michael Schmidt is a small farmer in Owen Sound, Ontario, who believes in the principles of biodynamic farming—growing crops and raising animals in a traditional, ecologically sustainable manner. In the last two decades, Schmidt has found himself in hot water with health authorities because he supports the production and distribution of raw (unpasteurized) milk. In Canada, federal regulations have prohibited the sale of unpasteurized milk since 1991.1 In November, 2006, Schmidt's Glencolton farm was raided by over 20 police and government officers; his computer and milking equipment were removed from the premises. In October, 2008, Michael Schmidt was found guilty of contempt of court charges, related to the distribution and sale of unpasteurized milk—he was fined $55,000. In January, 2009, Schmidt will stand trial for 22 charges related to the 2006 farm raid.[2,3]

What are the arguments on both sides of the issue? Who is right? You be the judge.

Pasteurized Milk

Some Facts to Chew on:

- Historically, unpasteurized milk has been linked to many serious diseases. However, since the introduction of pasteurization in the early 1900s, the incidence of milk-related, food-borne diseases has decreased dramatically. In Ontario, pasteurization requires heating and maintaining the temperature of milk at 72°C for 16 seconds, in order to kill bacteria such as Salmonella, E. coli and Listeria.[1]
- The Milk Act makes it illegal to sell unpasteurized milk in Canada, but a loophole in the legislation allows farmers to consume this milk, if it is produced by their own animals.

What Public Health Authorities say:

- "Health Canada would like to remind Canadians not to drink raw (unpasteurized) milk because it could contain bacteria that can make you seriously ill…these bacteria can lead to very serious health conditions ranging from fever, vomiting and diarrhea to life-threatening kidney failure, miscarriage and death. Children, pregnant women, the elderly and individuals with compromised immune systems are particularly at risk…Raw milk has not been treated to make it safe, but instead has [only] been refrigerated at the farm where it was collected.[5]

Unpasteurized (Raw) Milk

Some Facts to Chew on:

- Over the past fifty years, autoimmune disorders have been increasing in developed countries. In addition, almost half of the people living in these countries suffer from allergies. Some scientists hypothesize that we have become "too clean" and aren't being exposed to the bacteria necessary for strong immune systems. Pasteurization could be negatively impacting our health, by removing beneficial bacteria from the milk we drink.[4]
- Michael Schmidt has attempted to set up a "cow share" program which allows individuals to invest in a cow, thus allowing legal access to the unpasteurized milk which is produced by the animals.

What Michael Schmidt says:

- I have consistently asserted, that the raw milk from our cow share operation is far safer for human consumption than today's commercially distributed pasteurized milk…No government official has ever proven that the milk from the cows on our farm is harmful, dangerous or has ever caused health concerns… In contrast, according to the recent Auditor General's report, over half of the licensed dairy plants in Ontario showed significant bacterial contamination and continue to operate freely.[6]

Milking the Issue—The Raw vs. Pasteurized Debate

What Supporters say:

- There are people who drive cars who say that they would prefer to drive a car without a seatbelt, that they wouldn't be as restricted…But we know it's in the better interest of the public, particularly our youngest, that we have laws in the province that require someone driving a car to wear a seatbelt. The same with raw milk.
  Hon. Leona Dombrowsky,
  Ontario Minister of Agriculture[7]
- We have seen and heard of numerous examples of the severe consequences of raw milk, as provided by numerous Medical Officers of Health …This is another Walkerton waiting to happen if concrete action isn't taken to crack down on unlicensed food processors.
  Rosemary Moran, Women's Institute spokesperson[9]
- Cow rental or share ownership scams do not make raw milk consumption legal in Ontario. These scams have been struck down in Ontario court decisions in the past. The legislation under the Health Promotion and Protection Act is very clear that it is illegal to sell, offer to sell, deliver or distribute raw milk in Ontario.
  Bruce Saunders, Chair, Dairy Farmers of Ontario[9]

What Supporters say:

- Why does everything need to be so controlled and against what is…a natural state of things? What interests and financially controlled markets are here at stake? And why can we not have the right of making an informed decision about our health and the consumption of untouched and untainted milk?
  Andrei Lambert,Toronto[8]
- Diseased and stressed cows produce contaminated milk. These are problems in intensive farming where non-traditional feeding and housing of dairy cows is practiced…[Pasteurization] is a useful food safety tool…Both raw and pasteurized milks are safe foods and should be considered as different foods.
  Ron Hull, PhD.[10]
- When a consumer obtains food directly from a farm, the general public is not involved. The responsibilities for the qualities of the food (both beneficial and adverse) are fully vested in those two parties. Therefore, there is no role for government in such a transaction.
  Ted Beals, M.D. (certified Pathologist)[10]

Sources:
1 Erica Weir et al, "Raw Milk and the Protection of Public Health" CMAJ 177 (7) (25 September, 2007), <http://www.cmaj.ca/cgi/content/full/177/7/721?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=raw+milk&andorexactfulltext=and&searchid=1&FIRSTINDEX=0&sortspec=date&resourcetype=HWCIT> (accessed 28 January, 2009)

2 CBC Documentaries, "Raw Milk Crusader Timeline," <http://www.cbc.ca/documentaries/thelens/2008/michaelschmidt/timeline.html> (accessed 29 January, 2009)

3 The Bovine. "Raw Milk Producer Fined $55,000 — Globe and Mail readers speak up," <http://thebovine.wordpress.com/2008/12/04/raw-milk-producer-fined-55000-globe-and-mail-readers-speak-up/> (accessed 28 January, 2009)

4 Nathanael Johnson. "The revolution will not be pasteurized: Inside the raw-milk underground," Harper's Magazine (April 2008), <http://www.harpers.org/archive/2008/04/0081992> (accessed 28 January, 2009)

5 Health Canada. "Health Canada Reminds Canadians about the Risks of Drinking Raw Milk," (1 August, 2006) <http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/_2006/2006_65-eng.php> (accessed 28 January, 2009)

6 Glencolton Farms, "Farmer Michael Schmidt Makes His Case to the Media at Queen's Park," <http://www.glencoltonfarms.com/index.php?option=com_content&task=view&id=210&Itemid=33> (accessed 28 January, 2009)

7 Glencolton Farms, "Province Quashes Raw Milk Motion," <http://www.glencoltonfarms.com/index.php?option=com_content&task=view&id=84&Itemid=29> (accessed 28 January, 2009).

8 Glencolton Farms, "A Simple Story," <http://www.glencoltonfarms.com/index.php?option=com_content&task=view&id=35&Itemid=31> (accessed 28 January, 2009)

9 Dairy Farmers of Ontario, "Raw Milk Debate is Misleading Consumers and Putting Lives at Risk," <http://www.milk.org/Corporate/pdf/News-Dec0706.pdf> (accessed 28 January, 2009).

10 The Bovine, "Ron Hull Ph.D. and Dr. Ted Beals — Michael Schmidt's expert witnesses," http://thebovine.wordpress.com/2008/12/26/ron-hull-phd-and-dr-ted-beals-michael-schmidts-expert-witnesses/> (accessed 28 January, 2009)

This lesson is intended for grades 9 or 10, and works well as an introduction to food and food security and the lessons on the topic. It is suitable for a visual art, applied design, graphic design class, but can work in most other courses.

Estimated time required

Three classes of approximately 75 minutes
Lessons are meant to be successive with the required work done over the course of the three classes on the part of the student.

Overall Expectations

- Become acquainted with a "Harvest Calender" and what is locally grown in a particular area throughout the year.

Enduring understandings

Students will gain an understanding of what is grown, when and where in Ontario.

Prior Learning

- Knowledge of various produce.
- Computer research skills.

Getting Ready

- Copies of calendar grids, BLM 1C–1, including each month of the year.
- Use of a computer lab or have photocopies of BLM 1C-2, Harvest Calendar, from the website: *www.niagaraculinarytrail.com/uploads/pdf-docs/harvest-calendar.pdf*

Resources

A variety of materials should be available, such as glue, a variety of paper, various lead and coloured pencils, various dry media and paint.




Teaching & Learning Strategies

1. Students are asked to name different types of produce. The teacher will list the items on the board in two columns, imported and local.
2. When the students have brainstormed a substantial list, question the class regarding the two lists—why they have been put in two separate columns? Is there any produce that is local that they are surprised about? Do they have any ideas where or when these local items are grown?
3. Introduce the art project. They are to choose a month of the year to illustrate a calendar page for one item of produce that is being harvested during that month. They are to design an original image that illustrates the chosen produce and incorporates one interesting or informative fact about this item. Planning a class period in a computer lab to do research for all this is suggested.

- Note—Depending on the number of students in the class, each month may be illustrated by one student or in pairs to produce one full calender, or if the class is large enough, one student per month with two full year calendars being designed.

4. Once the students have chosen the month and the produce, and they have determined the factual information they will incorporate, they can begin by making rough sketches and layouts for their calendar page. They are to work out colour schemes, typography (font) choices and placement.
5. Once they have 4–6 design layouts, they are to choose (with the aid of the teacher) their strongest design. This will be enlarged and a good copy will be made.
6. When the students have their designs completed, they are to design and prepare their month's calendar page by designing the name of the month and inserting the correct numbers for the days of the week for that month. A blank calendar page has been provided for this.
7. When all the designs and calendar pages are complete, they are complied and organized by month into a full length calendar and hung up in the class for everyone to view. An informal critique can be held, commenting on the image designs and the informative fact for each month. The calendar pages can remain up in the classroom for the duration of the course or the year, so it can be continually referenced and used.

Extension Activities

- The calendar(s) can be reproduced for each student in the class or for fundraising purposes and sold in the school or community.

Calendar Grid

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY

Harvest Calendar

Produce	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
		x	means available				F	means peak harvest time				
Fruit												
Apples	x	x	x	x	x			F	F	x	x	x
Apricots							F	F				
Blueberries							F	F	F			
Cherries - Sweet							F	F				
Cherries - sour							F					
Currants - Black and Red							F	F				
Gooseberries							F	F				
Grapes								F	F	F		
Muskmelon								F	F			
Nectarines								F	F			
Peaches							F	F				
Peaches - Freestone								F	F			
Pears	x							F	F	x	x	x
Plums							F	F	F	x		
Raspberries							F	F				
Strawberries						F	F					
Tayberries							F	F				
Vegetables												
Asparagus				F	F							
Beans						F						
Beets	x	x	x	x			F	F	F			x
Broccoli							F	F	F	F		
Brussel Sprouts										F	F	
Cabbage	x	x	x	x			F	F	F	F	x	x
Carrots	x	x	x	x			F	F	F	F	x	x
Cauliflower								F	F	F	x	
Celery							F	F	F	x		
Corn								F	F			
Cucumber	x	x	x	x	x	x	x	F	F	F	x	x
Eggplant								F	F	x		
Garlic	x	x	x	x	x	x	F	F	F	F	x	x
Leeks	x	x						F	F	F	F	x
Lettuce						F	F	F	F			
Mushrooms	x	x	x	x	x	x	x	x	x	x	x	x
Onions - spring						F	F	F	F	x	x	
Onions - cooking	x	x	x	x	x	x	F	F	F	x	x	x
Parsnips	x								F	F	F	F
Peas							F	F				
Peppers								F	F	x		
Potatoes	x	x	x						F	F	F	F
Radicchio									F	x		
Radishes					F	F	F	F	F	x		
Rhubarb					F	F	x					
Spinach						F	F	F	F	F		
Squash	x	x	x						F	F	F	F
Tomatoes								F	F	F	x	
Zucchini							F	F	F	x		

2nd Course. **WHERE DOES YOUR FOOD COME FROM?**

Estimated time required

six 75 minute classes

Overall expectations

By the end of these activities, the students will be able to:

- discuss their families' ethno-cultural food choices and preparation techniques
- recognize that selection and breeding of food crops is a result of consumer demand and industrial needs
- recognize the value of diversity in the natural world.
- understand the complexity of factors which contribute to our food choices

Enduring understandings

Students will understand the connection between food choices, food crops, industrial agriculture and the environmental sustainability of our food supply. They will see that food is linked to culture.

Prior Learning

These activities can be adapted to stand alone or be used in conjunction with the other lessons in this unit.

Getting Ready

Duplicate the black line masters for students:

Lesson 1:	BLM 2A-1 Tomatoes 101
	BLM 2A-2 Recipe Roundup
Lesson 2:	BLM 2A-4 Industrial Tomato Selection
Lesson 3:	BLM 2A-6A Heirlooms
	BLM 2A-6B Heirloom Match
Lesson 4/5:	BLM 2A-7A and BLM 2A-7B Grandma's Grocery Dilemma
Lesson 6:	BLM 2A-8B The Doomsday Seed Vault

Make overhead or incorporate into Powerpoint:

Lesson 2:	BLM 3 Tomato Anatomy/Observations
Lesson 3:	BLM 5 Tomato Varieties
Lesson 6:	BLM 8B The Seed Ark

Lesson 1—Teaching & learning strategies

Prior to the lesson, students should read BLM 1 (Tomatoes 101). In preparation for this lesson, students are asked to find one frequently prepared family recipe that includes tomatoes, and to bring this recipe to class.

On the day of the first lesson, the teacher should bring in his/her own family recipe(s).

1. Discuss BLM 2A-1, Tomatoes 101, by using the following questions:

- On average, how many kilograms of tomatoes does a Canadian eat each year? What could this weight be compared to? (for comparison purposes, what are some other things that have the same total weight?)
- Where did tomatoes originate and how did their seeds migrate around the world?
- Are tomatoes fruit or vegetables?
- In the early 1900s, into what were tomatoes made?
- What is hybridization? Can you give an example?
- What is a GMO? What was the FlavrSavr Tomato? Why is this tomato no longer available in grocery stores?
- Where are most of the greenhouse tomato producers in Canada? Can you find these places on a map of Canada?
- What are some common ways that we consume tomatoes?

2. Place students in groups of three to four, in order to discuss their family tomato recipes. Explain that now that we have discussed some basic facts about tomatoes, we are going to see how tomatoes are used in recipes.
   When students are in groups, each student should be interviewed about his/her recipe. One group member can ask the questions, and another can summarize and record the information on BLM 2A-2, Recipe Roundup.
3. Regroup as a class and ask each group to highlight some of the most interesting things that it found from the discussion (highlight one of the tables, anecdotal stories etc.). The table should be handed in to the teacher once the activity is completed.
4. As a final wrap-up to this activity and as a connection to Lesson 2, do an informal summary on the board (and record the results). Ask students the following questions:

- When you make a recipe or eat fresh tomatoes, what qualities do you look for in the tomato?
- How do you choose fresh tomatoes for your recipes?
- How do you choose canned or processed tomatoes for your recipes?

These questions may also be used with reference to other produce included in recipes.

Lesson 2—Teaching & learning strategies

For the second lesson, students should bring in one tomato (preferably in a rigid container). The teacher should also bring in four or five different varieties of tomatoes (if possible), a cutting board, small plastic knives, paper plates, and some paper towels or wet-wipes (or a rag and water if a sink is not available close by).

1. Have students bring in their tomatoes. Ask students to wash their hands. Ask students to form groups by finding people who have tomatoes that look or smell different from their own. Groups should be made of three or four people. Once the groups are established, distribute paper plates to students. Give each group a plastic knife

and ask students to cut their tomatoes into fourths or eighths.

2. Ask students to initially hypothesize and then make observations about the tomatoes that are being examined and to answer the following questions (BLM 2A-3 may be shown as an overhead or incorporated into a PowerPoint presentation—students should use the bottom of BLM 2A-3 as a template). How does the tomato smell? How does the tomato look? (colour, shape etc.) How does the tomato taste? How much do you think the tomato weighs? Measure the walls of the tomato—how wide are they? How does the tomato look inside? What do you think are some chemical properties of tomatoes?
   Science teachers who have access to scales and/or litmus paper (to test pH levels) may want to measure and test for acidity as well.
3. Regroup as a class and discuss findings among all groups. Use the top of BLM 2A-3 to show students the different parts of the tomato. Ask students why they think tomatoes have the characteristics which were found.
4. Refresh students' memories with the information that you collected from the informal survey taken at the end of the Lesson 1. Write the results on the board.
5. Tell students that as consumers, we make choices every day. Our money is the way that we vote for the food that is put on our grocery shelves.
6. Using Lesson 1 survey results, ask students:
   How do they think companies choose the tomatoes that they sell for fresh-market consumption?
   How do companies choose the tomatoes that they sell for processing and canning?
7. Make a list of the qualities that students come up with for both of these categories.
8. Give students BLM 2A-4, Industrial Tomato Selection/Nutritional Values, so that students can compare their own results to the companies' selection processes. Ask students:
   How are the lists similar? How are the lists different? What surprised the students?
9. Students should read the remainder of BLM 2A-4.

10. Refer to the Table, "Fresh Tomato Nutritional Values", BLM 2A-4. Ask students to comment on why they think nutritional values have changed between 1963 and 2006. Answers should reflect students' reading about industrial tomato farming.

Lesson 3—Teaching and learning strategies

1. Show students BLM 2A-5, Tomato Varieties, on an overhead or as part of a Power Point presentation.
2. Ask students to determine how many varieties of tomatoes are available at each level of the diagram (where each tomato represents 60 different varieties).
3. Ask students:
   How does limited availability impact us?
   Answers should include—impact on nutrition, less choice as consumers, strengthening of industrial agriculture over local producers, impact on the environment due to pesticide and/or ripening agent sprays, as well as decrease of biodiversity.
4. Ask students:
   How can we ensure that we have other choices as consumers and that the characteristics that we want in our food (such as excellent nutrition and flavour) are maintained in our food supply?

Some answers may include:

- buy locally (farmer's markets)
- buy organic
- plant a garden
- plant heritage seeds or heirloom varieties
- learn how to preserve the food that you buy
- eat in season
- demand choice from grocery chains
- take the time to learn about where your food comes from, to experiment with recipes, and to prepare meals that reflect the importance of food
- demand fresh, good quality, and culturally appropriate food that strengthens and reflects the "food culture" of your family
- support local farmers as alternatives to the industrial agricultural producers
- support community gardening and food programs
- write to MP's about appropriate food labelling and regulation of GMOs in our food supply

5. Ask students to read about heirloom plants, BLM 2A-6A,and to complete BLM 2A-6B, Heirloom Match. Teachers will need to photocopy, cut and distribute, preferably in envelopes, the heirloom match exercise to students. (Answer sheet is original BLM 2A-6B).

Lesson 4/5—Teaching & learning strategies

This lesson may be done prior to or after the students have watched the Common Threads DVD.

1. Three corners introductory activity:

a) Prior to the class, prepare three highly visible signs (preferably on construction paper of different colours) and place in the three corners of the classroom. The signs should read:
YES, NO, I'm not sure

b) Students are asked to listen to the following statements and move to the corner which represents their initial thoughts.

- I know where my food comes from
- I have been on a farm
- I eat some organic food
- I eat at least one fast food meal a week
- The food I eat is good for my body
- I am a vegetarian
- I am concerned about the welfare of animals
- I am concerned about the environment
- I read food labels
- My family or I have purchased food from a local farmers' market

c) After this activity, students are asked to sit down. Teachers may wish to ask students to elaborate on some of their choices, or may wish to move on, stating that this activity was an introduction to lessons on industrial and alternative agriculture.

2. Hand out BLM 2A-7A and BLM 2A-7B, Grandma's Grocery Dilemma, and ask students to read "The Situation." Divide the class into the appropriate number of groups and assign all (or some) of the topics included in the header rows of the two tables shown in BLM 2A-7B. For the industrial/organic fruit and vegetable topics, students may choose to address these areas generally, or may choose to focus on one or two specific kinds of produce.
3. When doing the appropriate research, each group must answer either Question 1 OR Question 2 (based on its assigned food) as well as Question 3 on BLM 2A-7A.
4. Students use the charts, BLM 2A-7B, to rate their own group's information.
5. Each group chooses a representative to present the group findings to the rest of the class.
6. The teacher reviews the definition question #3a (please see answers below)
7. The information is presented in a community circle set-up* (or in a line at the front of the class if a circle is not possible).
   *Community Circle

a) the teacher arranges the appropriate number of chairs (# of presenters + 1) in a circle.
b) Presenters sit in the circle; all other students remain in their usual chairs.
c) Each presenter communicates his/her information. Other students remain silent. After each presenter has spoken, non-presenters who want to contribute information (statistics, background knowledge etc.) may sit in the empty seat, one at a time, and convey their information to the class.
d) Students fill out the appropriate rating chart column after each topic is presented.
e) Once all presenters have spoken, other students may ask questions to circle members. Ratings may be changed base on this interaction.

7. Once students have rated all of the presented topics, they should tally each column and write in their top three choices, at the bottom of BLM 2A-7B.
8. Students should re-group and tally the three top choices for their group. These results should also be recorded on the sheet.
9. The teacher should ask one representative from each group to write its top three choices on the board. These choices should be tallied by the teacher (or a student volunteer) in order to come up with an overall result for the class. By the end of the lesson, the class will know the top three food choices for Grandma's Grocery Store.

Definitions

INDUSTRIAL AGRICULTURE agriculture that relies on the availability of large tracts of land, advanced mechanization, large-scale irrigation, chemical inputs and monocultures, in order to produce enormous volumes of food.

ORGANIC AGRICULTURE farming in which herbicides, pesticides, antibiotic, or genetically modified products are not used.

INDUSTRIAL ORGANIC AGRICULTURE agriculture which uses the principles of organic agriculture, but which produces large volumes of food for a large number of consumers

FOOD MILES/KILOMETRES the distance food travels from field to table

FACTORY FARMS large-scale farms that have been created to allow production at the lowest possible cost

Lesson 6—Teaching & learning strategies

1. Have students read BLM 2A-8A, The Doomsday Vault.
2. Ask students the following questions related to their reading:

- When did the Svalbard Seed Vault open? Where is it located?
- At its opening, how many seeds did it receive? How much did these seeds weigh?
- Give some examples of the kinds of seeds that were sent to the vault.
- How many countries sent seeds to Svalbard?
- Give two reasons why the Svalbard Seed Vault is important for humanity.
- How are seeds preserved in the vault? How is the location/architecture of the Vault important for seed preservation?

3. Show students the beginning of the clip on the opening ceremonies of the Svalbard Global Seed Vault, so that they can get an idea what it looks like at the entrance as well as inside. You will need an laptop/digital projector. Preview the clip—you may find other useful visuals which may be interesting for your class.
   To link to the Svalbard Opening Ceremony, connect to:
   http://www.regjeringen.no/en/dep/lmd/campain/svalbard-global-seed-vault/film-archive.html?id=524817

4. If time permits, you may want to use your laptop to play an audio interview from the CBC's "The Sunday Edition" with Cary Fowler, Executive Director of the Global Crop Diversity Trust. He discusses the establishment and importance of the Global Seed Vault as well as the necessity of preserving genetic diversity.

- To link to this audio interview, connect to:
  http://www.cbc.ca/thesundayedition/listen_stream.html
  Click on the October 12, 2008 edition and advance the interview to 56:00 minutes. The interview will run for 22 minutes. Due to the length of the interview, you may choose to preview for pertinent sections.

5. After the students have learned about Svalbard, show them BLM 8B (The Seed Ark) on an overhead (or you may choose to give them individual copies) and ask them to suggest names for their "Seed Ark", as well as lists of important crops. You may choose to compile the names and/or crops on the overhead itself or on the blackboard.

Extension Activities

A. Have students investigate Canada's contributions to the Svalbard Seed Vault
   Useful links:

- Globe and Mail Article from February 25, 2008
  http://www.theglobeandmail.com/servlet/story/RTGAM.20080225.wvault0225/BNStory/International/?page=rss&id=RTGAM.20080225.wvault0225
- Global Seed Vault Seed Portal—under "Search the Seed Portal by" click on "Country of Origin"-> Under "Search Form" click on "C"->find "Canada"->click on "Details" in the last column.
  http://www.nordgen.org/sgsv/

B. Have students investigate jobs and careers connected to international seed banks, the Consultative Group on International Agricultural Research (CGIAR) and the Global Crop Diversity Fund.

- To link to CGIAR, connect to its website. On the right hand side of the home page, notice the "External Links" heading. There is a listing of all 15 independent foundations belonging to CGIAR. Each site has its own listing of available jobs. http://www.bioversityinternational.org/about_us/cgiar_and_us/
- To link to the Global Crop Diversity Fund, connect to its website. There is a listing of staff as well as job descriptions for each person. http://www.croptrust.org/main/staff.php

a) ask students to find three careers/job descriptions which sound interesting

b) students should take note of the job title, location of the job, salary (if available), as well as five qualifications for the job

c) as a class, share student findings. Discuss what kinds of training/education would be necessary to acquire these jobs.

C. Have students investigate energy efficiency at the Svalbard Seed Vault
http://www.regjeringen.no/en/dep/lmd/campain/svalbard-global-seed-vault/news/engineers-begin-critical-cooling-down-of.html?id=490911&epslanguage=EN-GB

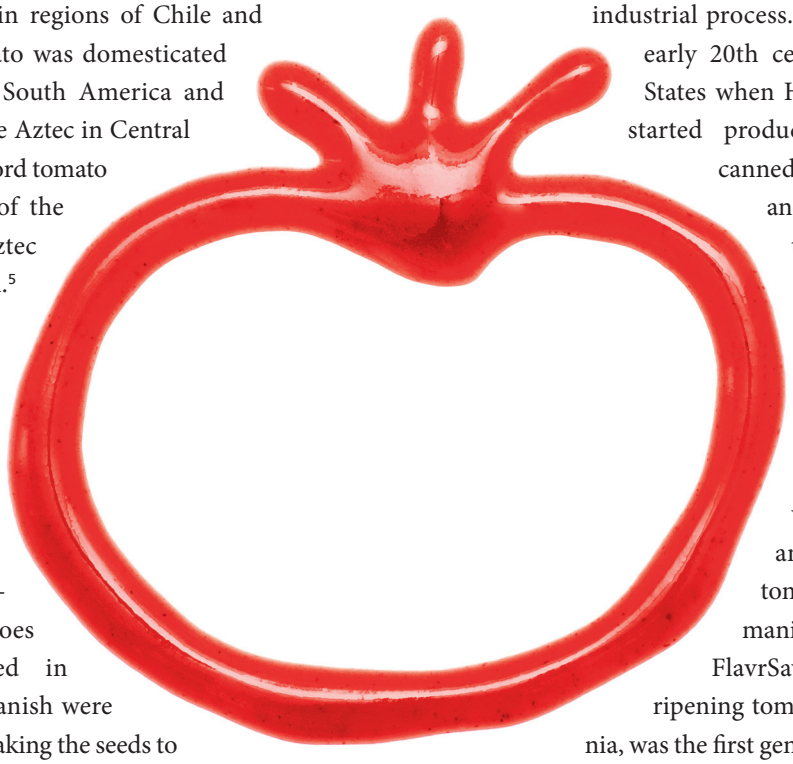
D. Have students find out more about the design of the Svalbard Seed Vault
http://www.regjeringen.no/en/dep/lmd/campain/svalbard-global-seed-vault/description.html?id=464076

E. Other useful links:
Frequently Asked Questions about the Svalbard Global Seed Bank
http://www.regjeringen.no/en/dep/lmd/campain/svalbard-global-seed-vault/frequently-asked-questions.html?id=462221

Tomatoes 101

How many tomatoes do you eat each year? The Association of Saskatchewan Home Economists (ASHE) estimates that each Canadian eats an average of 31 kg/year (68 pounds).[1] As you know, the tomato's versatility lends itself to the cuisines of many cultures. Aside from flavour, there are many positive health benefits to including tomatoes in our diets. One medium tomato has 25 calories and is a good source of the vitamins C and A, the minerals potassium, phosphorus, iron and calcium, folacin, and niacin and the cancer-suppressing antioxidant lycopene.[2,3]

In the genus Lycopersicon, there are nine species of the tomato. Only two of these are edible, L. lycopersicon (the common garden tomato) and L. pimpinellifolium, (also known as the "currant tomato" because of its small size). All nine tomato species originated in the high coastal mountain regions of Chile and Peru.[4] The tomato was domesticated by the Inca in South America and eventually by the Aztec in Central America. The word tomato is a derivative of the Nahuatl Aztec name tomatl.[5] Over time, the tomato migrated northwards. In the sixteenth century, the Spanish conquistadores discovered tomatoes being cultivated in Mexico. The Spanish were responsible for taking the seeds to the Philippines (where they spread to all of Southeast Asia), the Caribbean, Italy and Spain, and from there to the rest of continental Europe. By the 18th century, tomatoes had established themselves throughout much of Europe and had also made their way back to the New World.[6]

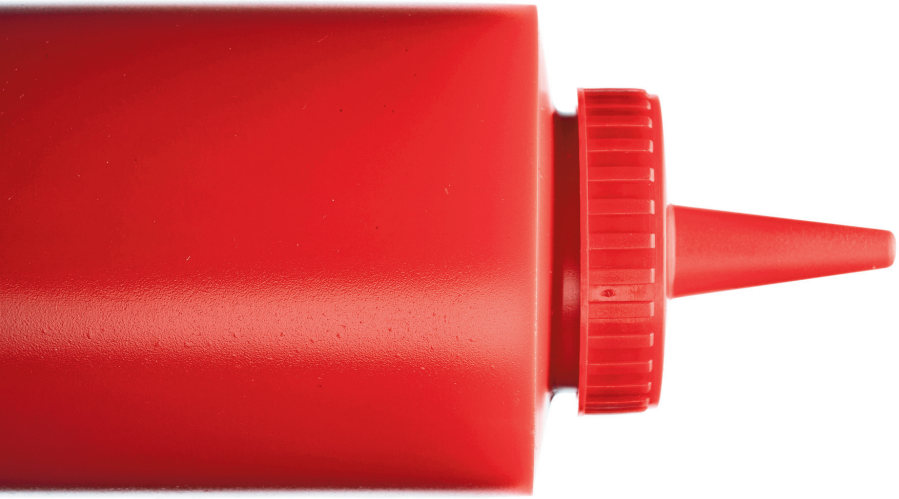


Botanically speaking, tomatoes are really fruit, because they are edible plants that carry seeds for reproduction. In North America, the tomato's misplaced identity is linked to a legal decision made by the United States Supreme Court in 1893. In the case of 'Nix versus Hedden', the Court ruled that the tomato is a vegetable because it is commonly eaten as part of a main course, rather than as a dessert.[7] In the late 1800's, all vegetables that were imported into the United States were taxed, but fruits were not. The Supreme Court's decision caused a decrease in the amount of tomatoes imported from Cuba and Mexico. As a result, many American tomato growers grew very wealthy as they became the country's primary suppliers.[8]

In the late 19th century, population growth resulted in increased commercial production for local and regional markets in both Europe and North America. The tomato was one of the first fruits to be subjected to an industrial process. This occurred in the early 20th century in the United States when Heinz and Campbell's started producing processed and canned foods—mainly soups and sauces—as a substitute for fresh tomatoes. In the 1900s, tomato production evolved into a sophisticated industrial art form. In the 1920s, hybrid tomato varieties were created and by the 1950s, tomato genes were being manipulated.[9] In 1994, the FlavrSavr tomato, a delayed ripening tomato grown in California, was the first genetically modified fruit or vegetable sold in the world. A few years after its introduction, production of this tomato was terminated, due to health and safety concerns by consumers.[10]

Tomatoes thrive in hot and dry conditions, but they can adapt themselves to almost any growing zone provided that there is sufficient sunshine and the season is

Tomatoes 101



long enough to allow the fruits to fully mature. Due to our climatic constraints, most of the tomatoes consumed by Canadians come from the United States. More than 50% of fresh-market tomatoes come from Florida, while more than 85% of the tomatoes shipped for processing into canned or other products come from California.[11] Increased investment and development of the greenhouse industry have resulted in Canada becoming a North American leader in greenhouse tomato production. This is particularly true in southwestern Ontario (mainly in the Leamington area) and the Delta region of British Columbia.[12] During the summer season, both Canadian-grown field and greenhouse tomatoes con tribute to overall supplies. In Ontario alone, there are 11 tomato processing facililities. The largest three, H.J. Heinz Company of Canada Ltd., CanGro Foods Inc. (formerly Kraft Canada Inc.) and Sun-Brite Canning Ltd., process approximately 85 % of the total volume of tomatoes produced locally. Of this quantity, approximately 70% of the tomatoes are made into tomato paste (which may then be manufactured into ketchup, soups and sauces), 20% are made into whole peeled tomatoes and 10% are made into juice.[13] Tomato products are incredibly popular. It is estimated that over 650 million bottles of Heinz tomato ketchup, alone, are sold worldwide each year![14]

Sources:

1 Dorothy Long, "Canning a Variety of Tomato Products, http://www.homefamily.net/index.php?/categories/foodnutrition/canning_a_variety_of_tomato_products/ (accessed 5 January, 2009)

2 Foodland Ontario, "Field Tomatoes," http://www.foodland.gov.on.ca/english/vegetables/fieldtomatoes/index.html (accessed 5 January, 2009)

3 Thomas Pawlick, The End of Food (Toronto: Douglas & MaIntyre Publishing Group, 2006), 5.

4 Carolyn J. Male, 100 Heirloom Tomatoes for the American Garden (New York: Workman Publishing, 1999), 1.

5 Agrestal Organic Heritage Seed Co., Seed Catalogue (Gormley: Agrestal Organic Seed Co., 2006), 42.

6 Male, 100 Heirloom Tomatoes for the American Garden, 1.

7 FindLaw "U.S. Supreme Court: Nix v. Hedden, 149 U.S. 304 (1893)" http://caselaw.lp.findlaw.com/scripts/getcase.pl?navby=CASE&court=US&vol=149&page=304 (accessed 9 January, 2009)

8 Adrianna Moranelli, The Biography of Tomatoes (St. Catherines: Crabtree Publishing Company, 2007), 5.

9 Asoka C.N. Mendis, The Greenhouse Tomato Industry in Delta British Columbia. [Degree] diss., University of British Columbia, (2007), 7. https://circle.ubc.ca/bitstream/2429/257/1/ubc_2008_spring_mendis_asoka.pdf (accessed 9 January, 2009)

10 Soil Association. "Flavr Savr tomato & GM tomato puree: Problems with the first GM foods," http://www.soilassociation.org/web/sa/saweb.nsf/b0062cf005bc02c180256a6b003d987f/9f8d26bd0d23b83c8025704600419579?OpenDocument (accessed 5 January, 2009)

11 Thomas Pawlick, The End of Food (Toronto: Douglas & MaIntyre Publishing Group, 2006), 8-9.

12 Mendis, The Greenhous Tomato Industry in Delta British Columbia, 9.

13 World Processing Tomato Council, "Tomato Processing in Canada" http://www.wptc.to/pdf/Canada%202006.pdf (accessed 5 January, 2009)

14 Moranelli, The Biography of Tomatoes, 17.

Recipe roundup

Each student should take responsibility for interviewing another member of the group as well as recording important information about tomato recipes. The following questions should be asked:

1. What is the name of the recipe?

2. What are the main ingredients?

3. How is the recipe prepared? (How long does it take to prepare and to cook?)

4. When do you typically eat it? (Time of day? Special occasion?)

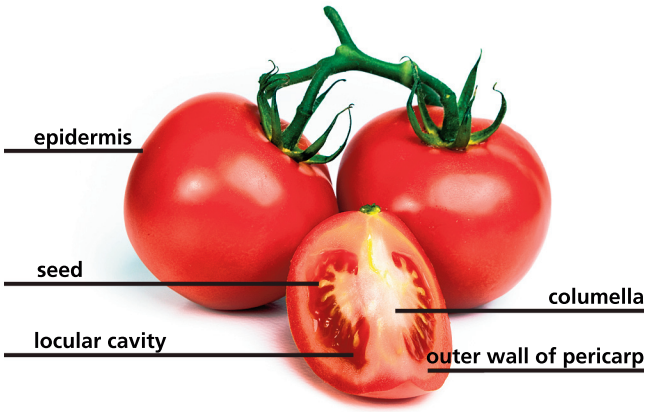
5. How long has the recipe been in your family?

6. Who usually makes this recipe?

7. Are there other foods/drinks that are typically served with this dish?

8. Do you add anything to this dish once it is prepared?

Tomato anatomy/observation



When left to ripen on the vine the sugars, acids and oils inside the tomato work together to create the fruit's distinct flavour. Tomatoes are rich in lycopene, which is the pigment that gives the epidermis its distinct colour. The pericarp wall forms the basic structure of the tomato and provides protection to the seeds and the surrounding gelatinous-filled locular cavity.

	General Hypothesis	Detailed Observations
Appearance	• colour • shape • insect/disease damage • measurement of pericarp • inside appearance	
	• Taste	
	• Weight	
	• Smell	
	• Chemical properties	

Industrial tomato selection/nutritional values

Examine a tomato from a grocery store and you will find some very interesting characteristics. Multinational companies involved in the food industry often deliberately breed and grow tomatoes for yield and ease of harvest and transport, rather than for flavour and nutrition. Most of the 15 varieties of tomatoes available in North American grocery stores have been chosen by industry specialists and scientific experts based on the following characteristics (in order of importance).

Fresh Market Tomatoes

1. yield (in pounds per acre)
2. large size (200-250 grams)
3. firmness (in terms of thickness/hardness of the outer pericarp wall—this allows tomatoes to withstand pressure and the weight of thousands of other tomatoes as they are all transported long distances by truck)
4. disease resistance
5. heat tolerance
6. uniformity of shape
7. uniformity in ripening time (colour)

Processed Tomatoes

1. yield
2. viscosity or thickness (which determines how much of a product can be made from a pound of the tomato's paste)
3. amount of soluble and insoluble solids in the fruit
4. firmness (ability to withstand rough handling during mechanical harvesting)
5. uniformity of colour
6. disease resistance
7. heat and cold tolerance (for production at the early and late ends of the season)

Mechanical harvesting, used for the processed tomato industry, and the long-distance travel requirements of the fresh-market industry, contribute to the lack of variety and nutritional value of the tomatoes which are often available to us. Corporate growers sometimes spray their tomatoes several weeks before harvest, with a multi-use pesticide/plant growth regulator. If the tomatoes aren't treated in the field, they are often harvested at their green stage, when the red colour is just beginning to show. The fruit is then artificially ripened in transit or at the destination market with ethylene gas. Ethylene is a naturally occurring plant hormone that is responsible for colour change, softening and flavour production. Artificial ethylene gassing, however, results in tomatoes which look red, but which are often sour or flavourless. Refrigeration during transport further reduces the tomatoes' aroma, sweetness and flavour.

Fresh tomato nutritional values*—1963 vs. 2006

Nutrient/ Mineral/Vitamin	Importance/Impact	% change (2006 vs. 1963)
Protein	essential for all aspects of growth and development, as well as for a strong disease-fighting immune system	22.7% less
Vitamin A	maintains good eyesight, normal sexual reproductive health and body growth	30.7 % less
Vitamin C (ascorbic acid)	prevents disease, controls stress, maintains normal arteries and to helps heal cuts and wounds	16.9% less
Potassium	essential for blood pressure regulation	9% less
Phosphorus	for bone and tooth development, energy metabolism and nutrient transport	11.1% less
Iron	part of hemoglobin (in blood), myoglobin (in muscles) and enzymes—too little can lead to anemia	10% less
Calcium	maintains strong bones and teeth	61.5% less
Niacin	promotes healthy skin, nerves, appetite and digestion	7.97% less
Fat (lipids)	necessary for normal cholesterol metabolism and production of vital cell regulators—excess can lead to heart disease	65% more
Sodium	fluid regulation and kidney-hormone regulation—excess can lead to high blood pressure and fluid retention	200% more

* based on 100g of today's average red, ripe whole tomato

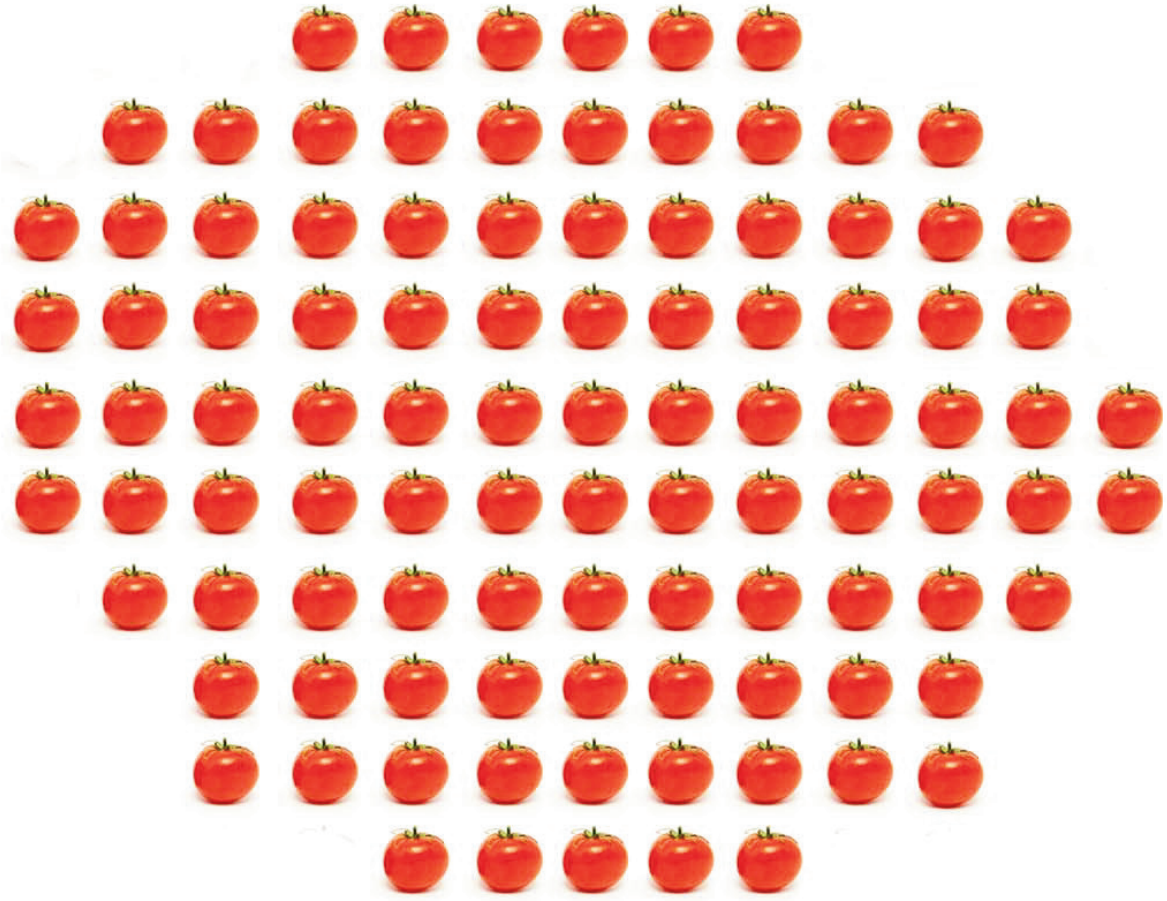
BLM Adapted from Sources:
Thomas Pawlick, The End of Food, (Toronto: Douglas & McIntyre Publishing Group, 2006), 4-11.

Denise Webb and Susan M. Smith, Foods for Better Health: Prevention and Healing of Diseases, (Lincolnwood: Publicaitons International, Ltd., 1994), 31-47.

Tomato varieties

= 60 varieties

Existing tomato varieties in North America



Number of tomato varieties grown in Ontario

Number of tomato varieties available in an Ontario grocery store

Sources:
Foodland Ontario, "Field Tomatoes," http://www.foodland.gov.on.ca/english/vegetables/fieldtomatoes/index.html (accessed 5 January, 2009)
Thomas Pawlick, The End of Food (Toronto: Douglas & MaIntyre Publishing Group, 2006), 10

Heirlooms

Shakespeare asked, "What's in a name?" Well, a lot actually, if you are a person or if you are an heirloom. Heirloom varieties of fruit, flowers and vegetables often have interesting stories that are associated with their names. The "Mortgage Lifter" for example, carries the story of 'Radiator Charlie', a legendary 1930s tomato breeder, who sold his tomato plants for $1 each, in order to pay off his $6,000 mortgage. It is said that gardeners would drive up to 200 miles each, in order to buy Charlie's seedling tomatoes.[1]

Most heirlooms are open-pollinated varieties, meaning that they can reproduce themselves from seed. These seeds are passed down from generation to generation and the seeds' history is often "intricately wound up with the cuisine, politics, folklore or science… of wherever they came from."[2] Heirlooms have adapted over time to whatever climate and soil they grow in. Consequently, they are usually resistant to pests, diseases and extreme weather events.

Many heirloom seeds are being preserved as well as distributed by international organizations as well as by Canadian groups such as Seeds of Diversity, a heritage seed program for gardeners.[3] Ontario is ripe (pardon the pun!) with local seed producers whose aim is to provide commercial growers, home gardeners and consumers with a variety of choices. By saving heirloom seeds and growing heirloom plants, we connect to the generations of gardeners and farmers who have recognized that biological diversity is healthy for the environment and for our bodies. Heirloom varieties provide us with viable alternatives to industrial agriculture. In addition, heirlooms grace us with a smorgasbord of eye-candy and flavour—a natural bounty that can be ours forever, as long as we choose to maintain it.

Three heirloom seed companies based in Ontario are the Agrestal Organic Heritage Seed Company, Upper Canada Seeds and Terra Edibles. In the tomato match-up exercise, you will have the opportunity to read some of the amusing and informative descriptions of heirloom tomato plants found in their seed catalogues. Try to decide which name goes with which description.

Sources:
1 Jefferson Monticello, "The Mortgage Lifter Tomato," http://monticellostore.stores.yahoo.net/600066.html (accessed 9 January, 2009)
2 Lynn Coulter, Gardening with Heirloom Seeds: Tried and True Flowers, Fruits, and Vegetables for a New Generation (Markham, Ontario: Fitzhenry, 2007), 3.
3 Seeds of Diversity, "Canadian Tomato Project," http://www.seeds.ca/proj/tomato/ (accessed 9 January, 2009)

Heirloom match exercise

Green Zebra	Matures in 75-80 days. This variety was developed in 1985 by legendary California tomato breeder Tom Waganer. Plants are relatively compact, but do not tend to vine. Skin is visually enchanting, maturing to an amber-yellow background with lime green stripes. Resists cracking and blemishes. Indeterminate.
Hillbilly	Fruits can reach 2lbs and have a sweet, fruity flavour. Orange/yellow with red streaks inside and out. Excellent yields. A very old heirloom from West Virginia. Indeterminate.
Peron Sprayless	Very productive 5 foot plants with lots of baseball-sized deep red fruit. Disease-resistant, blemish-free and great flavour. Keeps well after picking and has a high vitamin C content. A reliable producer in late fall. Originally from Argentina. Indeterminate.
Silvery Fir Tree	Very unique wispy foliage. A great ornamental plant that's not out of place in a flower bed. The production isn't huge but the taste is quite good. Does well in hanging baskets or a pot on patio. An heirloom from Russia. Determinate.
Big Rainbow	Mid-season. One of the prettiest bi-coloured tomatoes, can grow up to 2 lbs. Delicious and sweet. Striking when sliced as yellow fruit has neon red streaking through the flesh. Indeterminate.
Purple Calabash	Matures in 80-90 days. Identified as early as c.1600, this variety is well-known for its intense acidic flavour and has been called the "ugliest tomato". The thin skin is dark purple-pink to a bronzed chocolate-brown when ripe. Drought- tolerant. Indeterminate.
Cosmonaut Volkov	Matures in 65-75 days. A recent arrival in North America, this Russian variety has been named in honour of an astronaut who was killed during the landing of his spacecraft. Skin is bright red. Dependable even in cooler, damp climates. Indeterminate.
Chiapas	Matures in 60 days. The original seed for this ancient variety was gathered in Mexico. These beautiful botanical treasures produce hundreds if not thousands of small fruits 1cm in diameter. Skin is fiery red, with equally colourful flesh. Flavour is tangy, with a touch of sweetness. Not for the faint of heart. This sprawling cherry tomato needs space to grow. Indeterminate.
Kellogg's Breakfast	Matures in 85-90 days. This fine old variety is a family heirloom from Michigan. Tall leafy plants produce lovely big fruits up to 3.5" in diameter, weighing up to 2lbs. Skin and flesh are deep orange with a slight reddish tinge. The fruity, slightly sweet flavour make it an outstanding accompaniment sliced alongside a breakfast of fried eggs and bacon. Yummy! Indeterminate.
Sub-Arctic Plenty	(Also known as the World's Earliest) Matures in 45-55 days. Developed by Dr. Harris at the Beaverlodge Research Station in Alberta, this tomato is said to be able to produce fruit as far north as the Yukon. Beautiful and firm with no cracking, both skin and flesh are a bright red. Flavour is wonderful with a sugar acid balance that's just about perfect. An excellent slicing or sandwich tomato. Semi-determinate.

Sources:
Agrestal Organic Heritage Seed Co., Seed Catalogue. (Gormley: Agrestal Organic Heritage Seed Co., 2006), 43-48
Terra Edibles, Seed Catalogue, (Foxboro: Terra Edibles, 2008), 4-9
Upper Canada Seeds, Seed Listing, (Don Mills: Upper Canada Seeds, 2006), 3-5

Grandma's grocery dilemma

Introduction

In order to make good choices, we need to look at various alternatives. One way we can make an informed decision is to systematically compare the advantages and disadvantages of any given situation. Read the imaginary scenario below and follow the instructions that follow.

The Situation

Your 99 year old grandmother has won the lottery—5 million dollars! She is from a small rural town in Ontario and has spent most of her life as a stay-at-home mother/grandmother—something of which she is very proud. While she was raising her family however, she always dreamed about having her own business—a local grocery store. You are her favourite grandchild, and she has asked you to help fulfill her dream. For your efforts, grandma will allow you to run the store, give you a $60,000/year salary, and pass the business on to you in the future. You have agreed to accept the challenge. Your first step in this journey is to decide what kind of food you should sell in your grocery store—food that is a result of industrial or alternative agriculture?

The Research

Our Topic _____

1. For animal-based food sources, find the following information:

a) What are the living conditions for the animals while they are being raised?

b) Is anything done to the animals (in terms of anatomy/behavioural tendencies) in order for them to live with one another or on the farm?

c) What are the animals fed?

d) What kind of inputs are necessary for raising these animals (i.e., how much water, medicine etc. is needed?)

2. For plant-based food sources, find the following information:

a) Generally, how large are the farms that grow this kind of crop?

b) Who supplies the seeds for this crop (the farmer or is it purchased)?

c) What kinds of plants are grown—are they F1s, heirlooms, hybrids or GMOs?

d) What kinds of inputs are necessary to grow these plants (fertilizers, pesticides etc.)?

e) Are there any special growing techniques or machinery necessary to plant, grow or harvest this crop?

3. For all groups, answer the following questions:

a) Define the terms: Industrial Agriculture, Organic Agriculture, Industrial Organic Agriculture, Food Miles/Kilometres, Factory Farms

b) How is this food generally transported to grocery stores? How far does it travel?

c) What kind of nutritional value does this food have for human beings?

d) What are some of the positive/negative impacts that your kind of farming has on the natural environment?

e) Is your food cheap or expensive to produce? Why? What impact will this have on the grocery store?

Grandma's grocery dilemma

1. Individually, rate your group's findings by using the appropriate chart below.
   3= good or high, 2=medium, 1=low or poor
2. Choose one person from your group to present your findings to the information circle. While you listen to other presenters, rate their information in the charts below, using the same rating scheme from Q.1.

Sources:
Format for Grandma's Grocery Dilemma and Community Circle adapted from: Jeanne Gibbs, Discovering Gifts in the Middle School: Learning in a Caring Culture Called Tribes, (Windsor: Centre Source Systems, LLC, 2001), 265, 292-293.

CRITERIA	Industrial Beef	Industrial Chicken + eggs	Fish - Managed farms	Industrial Dairy	Industrial Fruit	Industrial Vegetables
Good for the environment						
Good for my health						
Good for my business (profit)						
Good for animal welfare						
TOTAL						

CRITERIA	Organic Beef	Organic Chicken + eggs	Fish - Wild stocks	Organic Dairy	Organic Fruit	Organic Vegetables
Good for the environment						
Good for my health						
Good for my business (profit)						
Good for animal welfare						
TOTAL						

Grandma's Grocery Top Three Foods

My top three choices:
1. _____ 2. _____ 3. _____

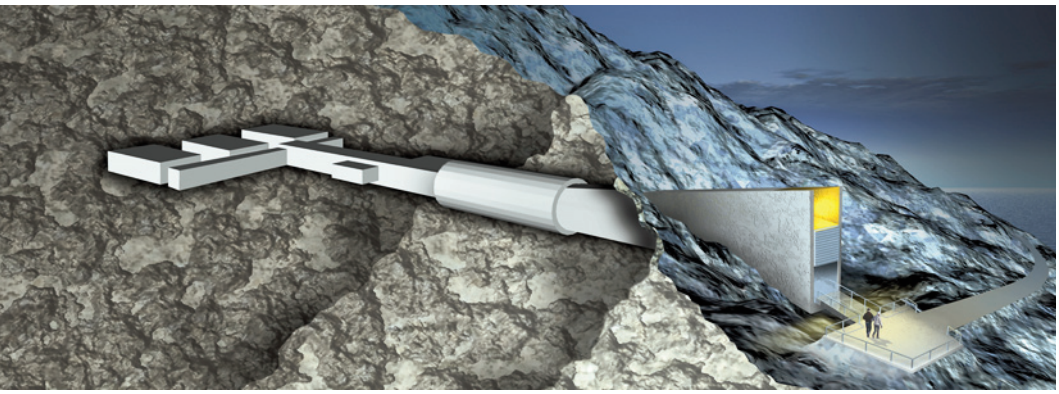
My group's top three choices:
1. _____ 2. _____ 3. _____

My class' top three choices:
1. _____ 2. _____ 3. _____

The Doomsday Vault

Drawing: Global Crop Diversity Trust

Svalbard Global Seed Vault: Arctic Seed Vault Opens Doors for 100 Million Seeds



LONGYEARBYEN, NORWAY (26 FEBRUARY 2008)—

The Svalbard Global Seed Vault opened today on a remote island in the Arctic Circle, receiving inaugural shipments of 100 million seeds that originated in over 100 countries. With the deposits ranging from unique varieties of major African and Asian food staples such as maize, rice, wheat, cowpea, and sorghum to European and South American varieties of eggplant, lettuce, barley, and potato, the first deposits into the seed vault represent the most comprehensive and diverse collection of food crop seeds being held anywhere in the world.

Drawing: Global Crop Diversity Trust

Built near the village of Longyearbyen on the island of Spitsbergen, the vault at its inception contains 268,000 distinct samples of seeds—each one originating from a different farm or field in the world. Each sample may contain hundreds of seeds or more. In all, the shipments of seeds secured in the vault today weighed an astonishing 10 tons, filling 676 boxes.

The opening of the seed vault is part of an unprecedented effort to protect the planet's rapidly diminishing biodiversity. The diversity of our crops is essential for food production, yet it is being lost. This "fail-safe" facility, dug deep into the frozen rock of an Arctic mountain, will secure for centuries, or longer, hundreds of millions of seeds representing every important crop variety available in the world today. As well as protecting against the daily loss of diversity, the vault could also prove indispensable for restarting agricultural production at the regional or global level in the wake of a natural or man-made disaster. Contingencies for climate change have been worked into the plan. Even in the worst-case scenarios of global warming, the vault rooms will remain naturally frozen for up to 200 years.

"With climate change and other forces threatening the diversity of life that sustains our planet, Norway is proud to be playing a central role in creating a facility capable of protecting what are not just seeds, but the fundamental building blocks of human civilization," said Norway's Prime Minister Jens Stoltenberg.

"Crop diversity will soon prove to be our most potent and indispensable resource for addressing climate change, water and energy supply constraints, and for meeting the food needs of a growing population," said Cary Fowler, Executive Director of the Global Crop Diversity Trust.

The Svalbard Global Seed Vault is funded and established by Norway as a service to the world. The Global Crop Diversity Trust is providing support for the ongoing operations of the seed vault, as well as organizing and funding the preparation and shipment of seeds from developing countries to the facility. NordGen will manage the facility and maintain a public on-line database of samples stored in the seed vault, which has the capacity to house 4.5 million samples-some 2 billion seeds.

Prime Minister Stoltenberg and Wangari Maathai, founder of the African Green Belt Movement and 2004 Nobel Peace Prize Laureate, together delivered the first box of seeds to the vault. It contained rice

The Doomsday Vault

seeds specially prepared with varieties originating from 104 countries. The box was opened during the ceremony, and then resealed before being placed in the vault.

"The significant public interest in the seed vault project indicates that collectively we are changing the way we think about environmental conservation. We now understand that along with international movements to save endangered species and the rainforests of the world, it is just as important for us to conserve the diversity of the world's crops for future generations," Maathai said.

"The opening of the seed vault marks a historic turning point in safeguarding the world's crop diversity," said Fowler. "But about 50 percent of the unique diversity stored in seed banks still is endangered. We are in the midst of trying to rescue these varieties. Our success means we will guarantee the conservation and availability of these wildly diverse crops. Forever."

Unique Building

The building of the vault itself has attracted much outside interest due to its location and its unusual engineering, security, and aesthetic features. Its engineering allows it to stay cool with only a single 10-kilowatt compressor, which is powered by locally generated electricity.

The vault consists of three highly secure rooms sitting at the end of a 125-metre tunnel blasted out of a mountain on Norway's Svalbard archipelago. The seeds will be stored at minus 18 degrees Celsius (minus 0.4 degrees Fahrenheit) and sealed in specially-designed four-ply foil packages. The packages are sealed inside boxes and stored on shelves inside the vault. Each vault is surrounded by frozen arctic permafrost, ensuring the continued viability of the seeds should the electricity supply fail. The low temperature and moisture level inside the vaults will ensure low metabolic activity, keeping the seeds viable. If properly stored and maintained at minus 20 degrees Celsius (about minus 4 degrees Fahrenheit), some seeds in the vault will be viable for a millennium or more. For example, barley can last 2000 years, wheat 1700 years, and sorghum almost 20,000 years.

Anyone seeking access to the seeds themselves will have to pass through four locked doors: the heavy steel entrance doors, a second door approximately 115 metres down the tunnel and finally the two keyed air-locked doors. Keys are coded to allow access to different levels of the facility. Not all keys will unlock all doors. Motion detectors are set up around the site. Boxes of seeds inside the rooms are scanned before entering the seed vault.

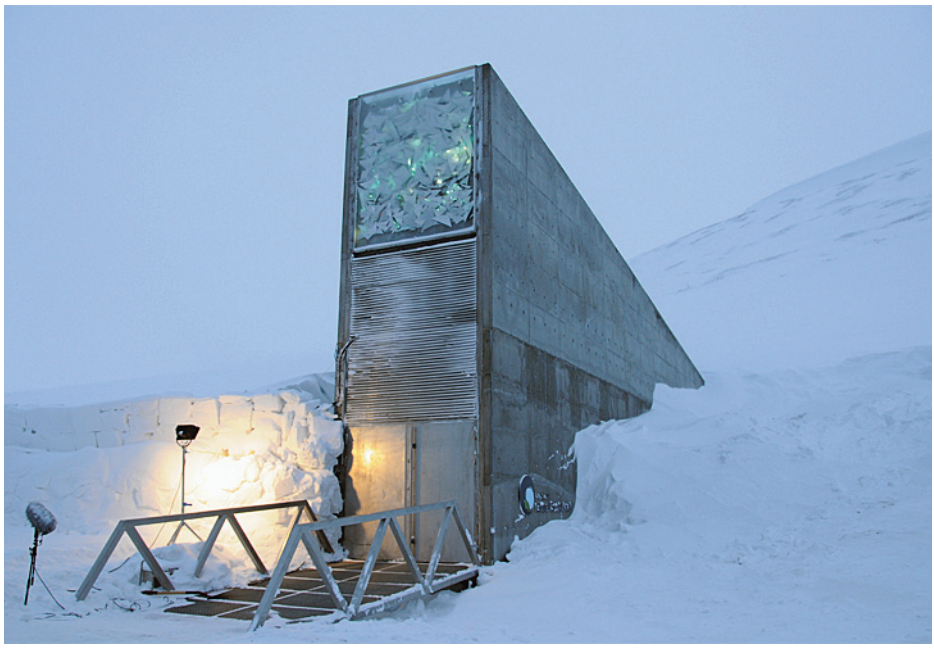


Photo above: Mari Tefre/Svalbard Global Seed Vault

A work of art also will make the vault visible for miles around. Artist Dyveke Sanne and KORO, the Norwegian agency overseeing art in public spaces, have worked together to fill the roof and vault entrance with highly reflective steel, mirrors, and prisms. The installation acts as a beacon, reflecting polar light in the summer months, while in the winter, a network of 200 fibre-optic cables will give the piece a muted greenish-turquoise and white light.

The Seed Ark

The Svalbard Global Seed Vault has been given a number of different monikers (nicknames) including the pessimistic 'Doomsday Vault' and the more optimistic 'Noah's Ark'. After learning about the Seed Vault, what do you think is an appropriate name for it?

Image, left, created by Melanie Bisnauth

If you could create your own 'Seed Ark' what would you call it? What 5 food crops would you choose to save? Why? Label the illustration, below, with the name you have chosen for it. Draw in the five food crops that you have selected and write your explanation below the ark.

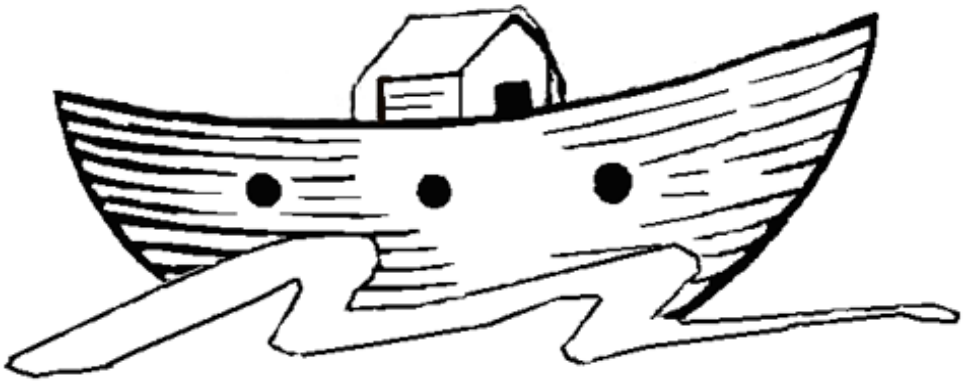
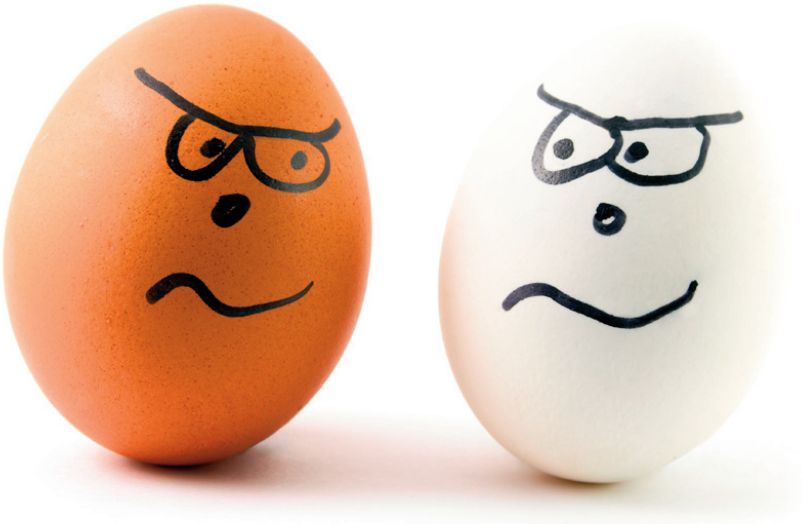


Image adapted from: http://www.raindrop.org/rugrat/fun/cark.gif



This lesson is intended for a senior art class with prior knowledge of various art history movements, and who have experience working in a variety of media and styles of art.

Estimated Time Required

One class period each to present the lesson and to do research, five to six additional class periods to complete the artwork, and one class to showcase and critique the artwork.

Overall Expectations

- Students will research and explore a topic or area pertaining to food and food security, and then invent a way to present the food in a place setting. The place setting should embody the message(s) or concern about the food and food security issue researched.
- Their work can be two or three dimensional.
- Each image is to include food, a plate, tableware, something to drink and perhaps a napkin.

Enduring Understanding

Students will continue to develop their artistic skills and stretch their imagination while learning about Surrealist art and the various aspects of food and food security.

Prior Learning

- Understanding of and experience in working with various media, including, but not limited to the following: pencil, pencil crayon, charcoal, conte, paint, charcoal, oil pastel, and various three-dimensional materials.
- Understanding of various drawing terms and types, including still life and perspective
- Exposure to various art and art history styles and the work of various artists
- Knowledge and experience of three-dimensional work and materials

Getting Ready

To support this lesson, articles should be chosen relating to the issue of food and food security, in order for the students to gain some background understanding of the issue. Once the assignment has been reviewed with the students, discuss this issue as a class to ensure a solid understanding of the topic. The students are to take notes in their sketchbooks and then choose one or two concepts or issues about food and food security which they would like to study and research in more depth.

Materials Required

The students are to choose the medium/media for their place setting. A variety of materials should be available, such as glue, a variety of paper, various lead and coloured pencils, various dry media, paint, a variety of three-dimensional materials such as wire, plaster strips, clay etc. The students are encouraged to collect their own materials as well, especially if they decide to work three-dimensionally.

Visual Resources

- Works by Italian artist Giuseppe Arcimboldo: Summer, a 1575 Renaissance portrait of a man made up of fruit and vegetables. Also look at Portrait of Rudolf II as Vertumnus.
- The works of Surrealist artists such as Salvador Dali and Rene Magritte.
- Reproductions of Judy Chicago's installation The Dinner Party, a large installation composed of place setting each inspired by a famous female.

Teaching and learning strategies—Lesson 1

- Introduce students to the Surrealist art style that juxtaposes normally unrelated objects in a realistic manner, for example, Rene Magritte's *The Castle of the Pyrenees* (1959), in which he turns varied subject matter into stone. Follow this by suggesting ways of interpreting the topic of food.
- Inform students they have permission to alter the characteristics of the subject matter they select. Student work will reflect researched information on food and food security and/or should communicate an intended message regarding the chosen topic.

1. Lead the class in a discussion about food from two different points of view.
   First, ask the students:
   - What makes food appealing?
   - What are some creative ways to view food?
   - How can you create a strong composition and visual interest?

   Second, present the topic of food security to the class and ask the students what they think this term means. Create a list of their ideas on the board. Present a variety of sub-topics on food security to the class and have a variety of articles and resources for them to read and review. As a class, or in small groups, read and/or review one or more of these resources and continue to discuss the topic. These topics may include local and organic farming, the industrialization of food production, bio-fuel made from corn and sugar cane, additives and preservatives, quality vs. quantity of food, availability of food from one economic group or from country to country, growing rates of obesity, etc.
2. Have the students choose one sub-topic of food and food security to research in greater depth. Provide the class with a variety of resources from the Common Threads resource—*Hungry for Change: Cultivating an Understanding of Food Security*—to read and review, and provide a class period to do research on their chosen topics in the library or a computer lab.
3. Once they have chosen a topic and conducted research, students should have a point of view that they want to express and communicate in their Creative Place Setting assignment. They are to begin by creating sketches for the final artwork. Encourage students to explore many ideas before making a final decision on the design and layout of their place setting.
4. Students should have a compositional point of view, such as looking down or at an angle, as though one were sitting down at a table. This will make the subject easy to identify. The viewer should be able to "read" the image immediately as a table setting. Students choosing to work three-dimensionally should use the size of a typical table setting as a way to assure visual readability.
5. Once they have a rough plan, they are to work on their good copy/version of the art piece. They will have class time to do so but may also need work on this project at home.

3rd Course. **THE POLITICS OF HUNGER**

Estimated Time Required

2 classes, approximately 150 minutes in total

Overall Expectations

By the end of this activity, the students will begin to understand the diverse causes and impacts of food insecurity around the world. They will learn that economic development often brings unexpected health and nutritional problems as a country's wealth increases, and that some forms of food aid or international assistance are more effective in providing healthy diets to countries and peoples in need.

Enduring Understandings

Students will understand that the causes of hunger are broad and diverse. Many solutions to the problem of hunger have unforeseen repercussions. As developing countries become more industrialized, and their citizens more wealthy, they are prone to developing many of the lifestyle diseases of the developed world, including obesity, heart disease and diabetes.

Prior Learning

This activity can stand alone as an exercise in understanding the basic causes and approaches to food security, or serve as an introduction to a unit concerning the causes and impacts of food security.

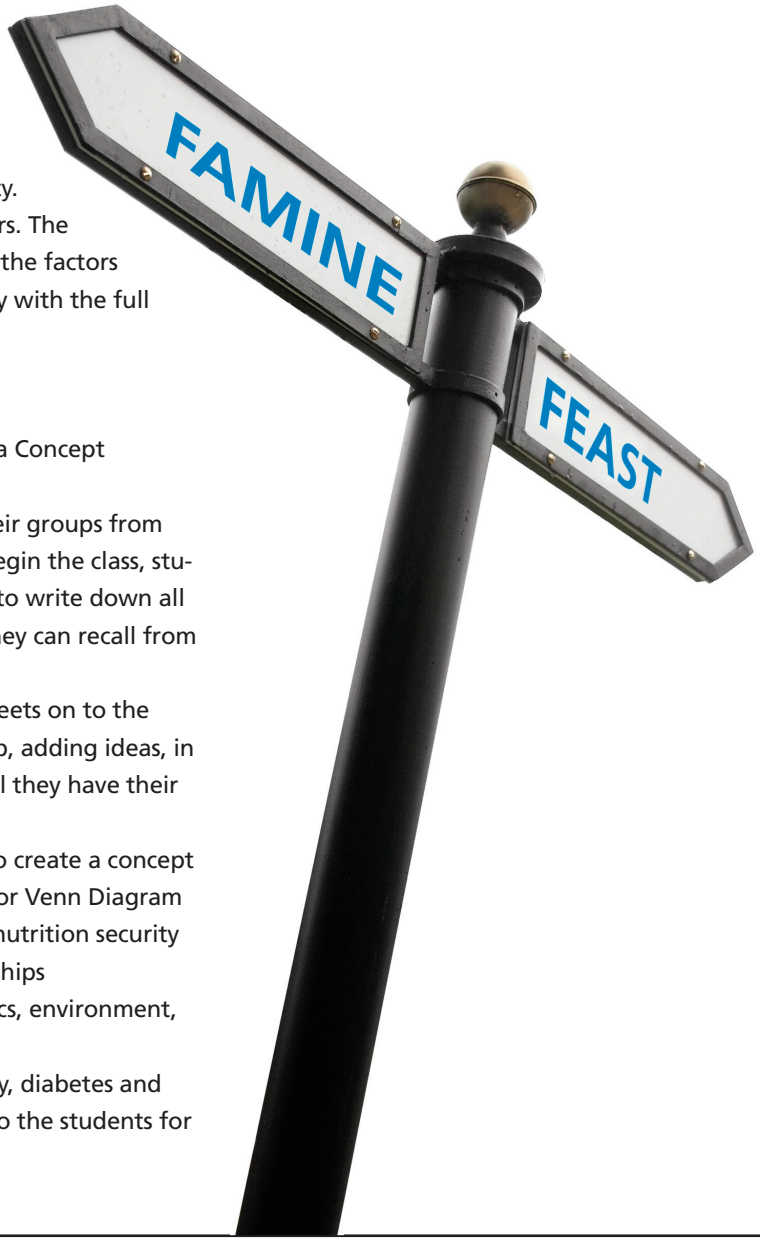
Getting Ready

1. Photocopy enough sets of the Feast or Famine "playing cards" for groupings of 5 or 6, BLM 3A-1. You may want to laminate the sheets prior to cutting the cards apart. Colour-coding of each set of cards will ensure that each group has a full set of cards.
2. Photocopy 1 scorecard per student, BLM 3A-2.
3. Copy Fishbone organizer, BLM 3A-3, or prepare instructions regarding concept mapping.
   (For information explaining concept maps see: Bennett and Rolheiser. (2001). *Beyond Monet: The Artful Science of Instructional Intelligence*. Toronto: Bookation, Inc. pp. 274–307)

Teaching and learning strategies—Lesson 1

Using "numbered heads" or other similar strategy, divide the class into groups of 5 or 6.
Distribute 1 set of cards to each group, and 1 score sheet to each student.

Students should place cards face down in the centre of the desk. Students determine who will begin, then proceeding clockwise, each student will draw a card from the deck and read it to the group. Each student will keep his/her own score on the scorecard, and record key points on the chart. Students will continue until all cards have been drawn. At the end of the game, students will tally their individual scores. The student with the highest overall score is the student who has greatest food security.



Groups will present their winners. The teacher will facilitate discussion of the factors that lead to food security/insecurity with the full class.

Day 2:
Consolidation of Learning: Create a Concept Map/Fishbone

Step 1. Students will return to their groups from the previous activity. To begin the class, students will take 2 minutes to write down all of the information that they can recall from the previous day.

Step 2. Students will pass their sheets on to the next member of the group, adding ideas, in a round robin format until they have their original sheet back.

Step 3. These ideas will be used to create a concept map, fishbone organizer, or Venn Diagram on the topic of food and nutrition security that includes the relationships between/among economics, environment, education and health.

Resources on the impacts of obesity, diabetes and heart disease should be available to the students for reference in the class.

Feast or Famine card game

You can now afford to drive to work instead of walking or riding your bike.

+1 economic point
-2 health points.

Your family can afford to shop in a supermarket instead of growing their own food.

+1 economic point
-1 health point.

Instead of water, you choose to drink sugar-sweetened soda.

-2 health points
+1 economic point.

You are forced to leave school to help support your family.

-1 economic point
-2 education points.

Canada sends your country meat products, corn syrup and vegetable oils to combat hunger.

Everyone +1 health point
-1 economic point.

Your heritage is Latin American, African or South Asian. You likely have a genetic predisposition for developing diabetes or hypertension.

-1 health point.

Your community now has electricity and your family purchased a satellite dish.

Everyone +2 economic points
-1 health point.

Your child dies because you are poor and cannot afford medical treatment.

-2 health points
-1 economic point.

Your family in the developing world moves to the city to find work.

+1 economic point
-1 health point.

You graduate from secondary school.

+3 economic points
+3 education points +2 health points.

Feast or Famine card game

You live in Latin America where family supermarket food expenditures increased from 15% in 1990 to 60% in 2000.

Everyone +1 economic point
-2 health points.

The World Bank has instructed your country to produce food for export, eliminating family farm food production.

-2 health points
-1 environment point.

You live in China where poor families spend more on cheap vegetable oils, increasing their obesity risk.

-1 health point.

Through the use of monocrops, the price of processed foods has decreased. Your diet is now higher in fat, sodium and sugar and lower in fiber than it used to be.

-2 health points.

As your country has become more developed, more people are consuming high fat beef, pork and dairy products, increasing their risk of heart disease.

Everyone +1 economic point
-2 health points.

To combat hunger in developing countries, the government issues cheques to women to pay for food in the supermarket. The intake of inexpensive processed food soars.

-2 health points.

The building of roads, factories and vehicles has decreased the need for manual labour, increasing the incidence of obesity.

Everyone +1 economic point
-1 health point.

To encourage better eating habits, your government decides to impose a tax on highly processed foods.

+2 health points.

Over 50% of all the households in your country now have television.

Everyone +1 economic point
-2 health points.

The Brazilian government issues cheques to women who send their children to school and attend nutrition classes.

Everyone +2 education points
+2 health points.

Feast or Famine card game

Your developing community has built a health clinic where mothers learn about prenatal care and the importance of breastfeeding.

+1 education point and 1 health point.

The government subsidizes restaurants that offer nutritious meals at low prices.

Everyone +1 economic point
+1 health point.

Your government subsidizes the production and consumption of fruits, vegetables and whole grains.

+1 economic point
+1 health point.

The government subsidizes the prices of basic fruits and vegetables to ensure a nutritionally adequate diet for all.

Everyone +2 health points
+1 economic point.

Every 30 minutes, 360 children die of hunger or malnutrition.

Everyone -2 economic points.

Eight hundred million people worldwide suffer from food insecurity.

Everyone -2 health -2 education
-3 economic points.

Your children are undernourished and have little resistance to disease. They are less able to learn if they attend school.

-1 health point -2 education points.

You are suffering from the most common nutrient deficiency, a lack of iron, which makes you tired and your hair loses its pigmentation.

-1 health point -1 economic point.

Feast or Famine card game

You are poor which puts you at very high risk of developing hunger or malnutrition.

-1 health point -1 economic point
-1 education point.

In your developing country, you have enough money to purchase seed to plant food for your family.

+1 economic point and 2 health points.

You live in a rural area of a developing country. You have a 75% risk of being chronically underfed.

-2 health points -1 economic point.

Your community has access to a reliable source of clean water for drinking and irrigation of crops.

Everyone +2 economic +2 environment points.

You are a landless person. This puts you at risk of being malnourished.

-2 health points -1 economic point.

The drought that affected your region last year has ended and this year's crops are plentiful.

Everyone +2 economic points
+2 environment points.

Your parent has HIV/AIDS. You have had to leave school to care for your brothers and sisters.

-1 health point
-2 education points -2 economic points.

An NGO has constructed a warehouse to safely and securely store grain for the community.

Everyone +2 economic points
-1 health point.

You are a female head of household. This significantly increases your risk of poverty and food insecurity.

-2 economic points -1 health point.

The roads that were washed out in last year's floods have been rebuilt so that crops can be transported to market.

+2 economic points.

Feast or Famine card game

In a developing country, your ethnic group is fighting for control of the government. It is not safe to go outside at any time.

Everyone -1 economic -1 health and 1 environment point.

The diversion of corn to ethanol production has led to food shortages and price increases.

-2 economic points -1 health point.

The developed world has agreed not to tax products coming from your country. This expands the market for the goods that you produce, and may increase your income.

+2 economic points.

The use of the by-products of sugarcane for ethanol production has opened up new markets and technologies.

+1 economic point.

As a local farmer, you are guaranteed a fair price and a market for all of the fruits and vegetables that you produce.

+1 health point and 1 economic point.

Global warming has led to the destruction of crops in many areas of the world, and food prices are skyrocketing.

-2 economic and -2 environment points -1 health point.

Your national and local government is free of corruption.

+2 economic points.

The industrialization of our food production has led to outbreaks of listeriosis across Canada.

Everyone -2 health points and 2 economic points.

Feast or Famine card game

The importation of milk products from China has led to food recalls in Canada to prevent kidney damage from eating contaminated food.

-2 economic points.

You purchase your food fresh from a farmer's market.

+1 environment point.

The globalization of our food supply has contributed to a decline in the number of family farms in Canada, and the paving over of arable land.

-3 environment points.

By reading labels, you purchase foods with as little processing and additives as possible.

+1 health point.

In Canada, the percentage of jobs in the agriculture sector is declining.

-1 economic point.

You purchase organic fruits, vegetables and meats.

+1 environment point.

You are one of the 43% of Ontario children who require food bank assistance.

-1 economic, 1 education and 1 health point.

You have reduced your intake of red meats and dairy products, and eat a vegetarian meal at least once a week.

+1 environment and 1 health point.

You have a minimum wage job, but require the help of a food bank to make ends meet.

-1 economic and 1 health point.

You are a recent immigrant to Canada and have a university degree. Since you cannot find a job, you need to visit the food bank.

-1 economic point.

Feast or Famine card game

Your community has established a gleaning program to support the local food bank

+1 health point

You have taken additional training courses and have just been promoted.

+1 economic point, 1 education point and 1 health point

Your community has developed community gardens so residents can grow fresh produce.

+1 health point, 1 environment point and 1 economic point

You live in the city, and are able to walk to work and shopping.

+1 health point and 1 environment point

Your family has subscribed to a local "good food box" of locally produced foods

+1 health point and 1 environment point

As a single mother with 2 young children, you are more likely to require support.

-1 economic point and 1 health point

A member of your family has been laid off of their job. Money is tight.

-1 economic point and 1 health point

You have a disability, and are more likely to require support.

-1 economic point and 1 health point

The minimum wage has just been increased in your community.

Everyone +1 economic point and 1 health point

You eat a minimum of 7 servings of vegetables and fruits each day.

+2 health points

Feast or Famine card game

You consume fish at least two times each week.

+2 health points

Your daily sodium intake is below 2500 mg because you avoid using processed foods.

+2 health points

You signed up for a cooking class to learn how to cook nutritious meals for your family.

+1 health point and 1 economic point

You have planted a vegetable garden in your back yard.

+2 health points, 2 environment points and 1 economic point

You visit a farmer's market each week for fresh produce.

+1 health point and 1 environment point

Your community has experienced flooding which has destroyed crops.

-2 economic points and 1 economic point

Sources for activities:
Food banks in Ontario (fact sheet). (2008). Ontario Association of Food Banks.

Pinstrup-Andersen, Per and Cheng, Fuzhi. (September 2007). "Still Hungry". *Scientific American*, pp.96-103.

Popkin, Barry M. (September 2007). "The World is Fat." *Scientific American*, pp.88-95.

Feast or Famine scorecard

Distribute the cards evenly between group members. Determine who will begin. Each team member reads a card aloud to the group. Members will record their individual score as each card is read and keep track of their own points. Record the factors that influence each aspect of food security as you work through the cards with your group.

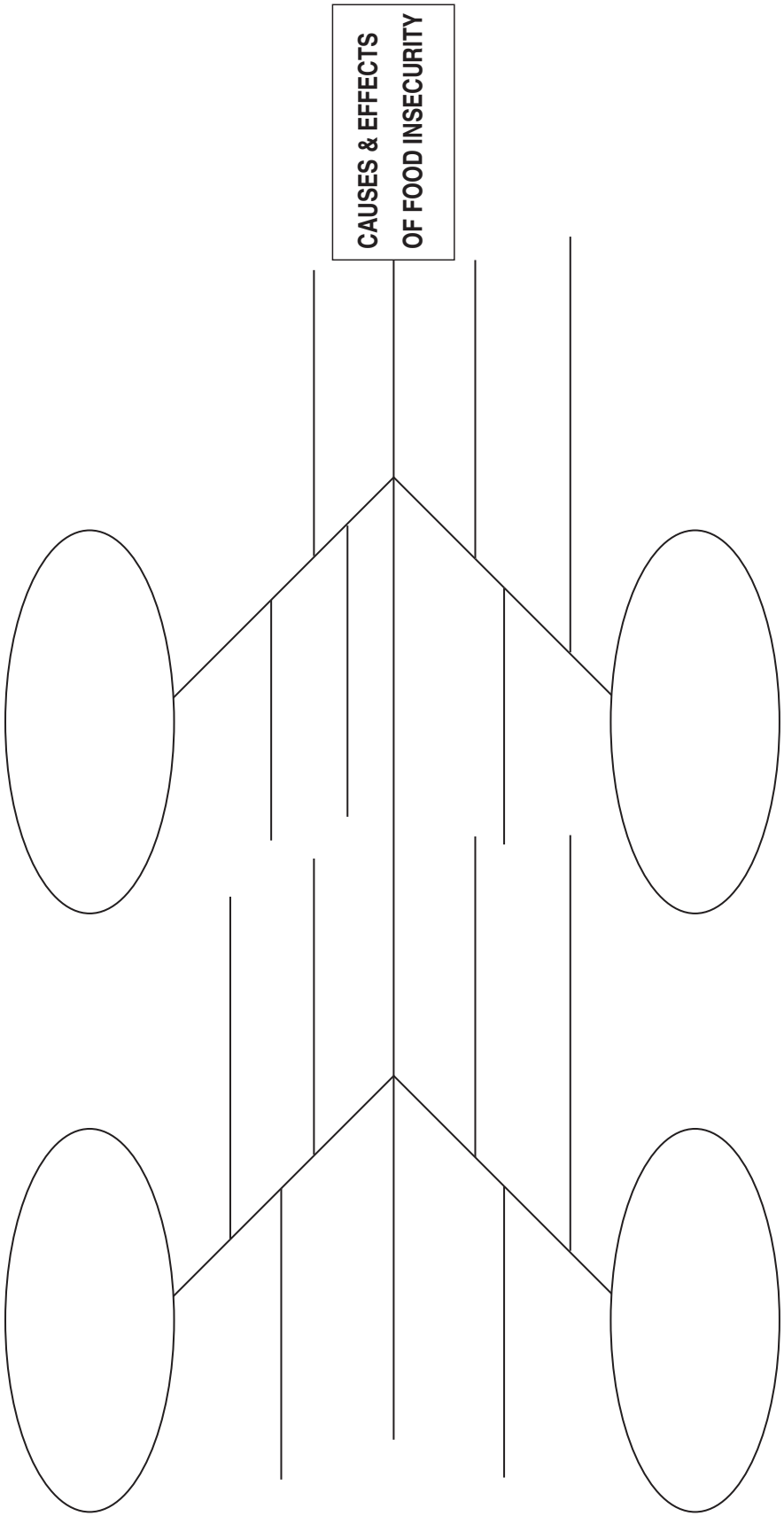
Name: _____

Economic Points	Health Points	Education points	Environment points
INFLUENCING FACTORS			

Points for Discussion

1. What are some of the key factors influencing obesity worldwide?
2. What are some of the key factors that contribute to and help reduce hunger worldwide?
3. What are some of the aspects of food security that affect Canadian and Ontario residents?

Fishbone organizer



This Lesson is intended for any Canadian and World Studies class, including Civics, Canadian and International Politics, Analysing Current Economic Issues, World Issues, and other related courses.

Estimated Time Required

2 classes of 75 minutes (plus additional time for optional extension activities)

Overall Expectations

By the end of this lesson, students will be able to:

- understand the correlation between population growth and food production, and how it affects the quality of life for people in various regions of the world.
- recognize patterns of population growth and food distribution in the world.
- evaluate the consequences of population growth and uneven distribution of food in the global economy.

Enduring Understandings

Students will be able to develop their mathematical, spatial/geographical and analytical skills, while developing an understanding of the political, social and economic impacts of food production and distribution in the world.

Prior Learning

- Understanding of the general global economic situation; the difference between developed and developing nations in the world
- Knowledge of the basic nutritional needs of a person for survival
- General understanding of basic mathematical and statistical skills

Getting Ready

To support this lesson, articles or visual resources can be used to create a framework of understanding of population growth and global food production in the world. Teachers may want to show the video resources in advance of this lesson that are found near the end of the presentation. Teachers may also wish to introduce a culminating task at the beginning of this lesson, which may include one of the options that are listed at the end of the presentation. Slides can be reorganized to fit the needs of the teacher and students. Some of the materials you may need for this lesson include:

- SMART Board, SMART Tablet or LCD/Data Projector, with Notebook software installed (any version of Notebook should work—see special instructions that accompany this package)
- Sound system for playing of video resources
- Internet connection (necessary for video links)
- Handouts—found in this package
- World Maps

Teaching & Learning Strategies

This lesson is designed to be flexible to meet the needs of the class and the teacher/instructor. The approaches used below follow the presentation in its original order. Changing the order of the presentation is at the discretion of the teacher and is encouraged where needed.

1. Opening Discussion. Prompt questions to check for prior knowledge. Ask the students some of the following prompt questions:

- Using the map of the world, identify what you think are the wealthiest and poorest nations in the world.
- Identify the countries or regions that you think have the highest and lowest populations.
- Identify the countries or regions that you think produce the most and least food per capita.
- Describe a developed nation in your own words.
- Describe a developing nation in your own words.
- What do you think is the minimum amount of food a person should have to survive and/or to live a healthy life on a daily or annual basis?

Place Mat Activity. Students in small groups can describe the characteristics of a wealthy or industrialized nation and developing nation in general and/or in relation to the topics of population, food production, technology and trade.

Slide	Teaching & Learning Strategies	Special Notes
1	• Introduction Slide • Use map background to identify regions and areas related to the prompt questions/exercises above	
2	• Discussion on the prompt question on the slide: "Looking at the chart above, what is the long term problem that is likely to occur?" • Discuss that the pattern shows that population is increasing at a higher rate than cereal production. Given that cereals and grains are relatively easy to grow, the same could be said for the production of other food staples. Students can estimate the cereal production numbers either by doing mathematical estimation or estimating visually. • Students can come up to the SMART Board to fill in their estimates	
3	• General discussion on the question of the possible consequences for the future based on the patterns shown on the chart. • Responses can be marked on the SMART Board and saved for review later. • Issues that may arise include global starvation, overpopulation, pressure on resources, need for more agri cultural land versus urbanization	
4	• For the remainder of the lesson, the world will be divided up into the regions shown on the map. • Students could estimate the population of each region based on the 6.551 billion statistic by writing their estimates on the SMART Board	Handout **BLM 3A-1: World Map** could be used for students to pencil in their estimates

Slide	Teaching & Learning Strategies	Special Notes
5	• Students can drag and drop the numbers at the bottom into what they think is the correct region. The box will tell them if it is correct or not • Students can take turns trying to get all nine regions correct. • Students can fill in their maps and/or the Chart handout(s) for future reference.	Handout **BLM 3B-2: Population and Cereal Production Chart**
6	• Students can look at the colour references and get an understanding of population growth patterns; have students identify those regions that have had significant population growth in the last 50 years • Discuss the areas of the world that are going to face resource pressures due to significant population growth. • Extend discussion by asking about what kind of resources would face pressure, including food, infrastructure, natural resources. • Student can fill in their Chart handout.	Handout **BLM 3B-2: Population and Cereal Production Chart**
7	• Students can look at the colour references and get an understanding of the cereal production growth patterns over the last 50 years; students can identify those with significant growth in cereal production, versus those that have had less growth. • Students can fill in their Chart handout.	Handout **BLM 3B-2: Population and Cereal Production Chart**
8	• Students can look at the data that they have recorded from the previous slides on their Chart. Handout the "Food Production and Speculation Matrix" • Students can complete this in groups.	Handout **BLM 3B-3: Food Production and Speculation Matrix**
9/10/11	• Examples of possible responses are provided on Slide 9 • Students can come up and fill in the boxes in point form when ready • Discussion point: Nations can only trade a resource if they have more than enough of that resource to meet basic needs of its citizens	Handout **BLM 3B-3: Food Production and Speculation Matrix**
12	• Discuss the three headings at the top; students and/or teacher can define their meaning. Have student(s) drag the region name under the appropriate column. There is no "right or wrong" answers; based on their initial analysis of the patterns that they have been discussing • Extension: Are students aware of recent food crises in areas that they may have identified as in a "Crisis" situation currently? What are the characteristics of a food "Secure" region? (Waste, access)	
13	• Discussion point: Is there enough food produced in the world? Is it just an issue of how it is distributed? • Have students consider the Canada Food Guide cereal and grain consumption recommendations for a typical adult for one year—75kg per person per year. This will be our standard for global consumption of cereal for a healthy diet.	
14	• Students can calculate the annual need for cereal consumption per region based on the population figures that they have looked at already. • Math Formula: Population x Cereal Need per Person = Cereal Need per Region per Year • Quick Formula: Use the population rounded to the nearest million x 75, and then divide the result by 1,000 - This will get you how many millions of tonnes of cereal that region needs annually based on Canada's Food Guide • Example: (332 x 75)/1,000 = 24.9 Round off your result to the nearest whole number (e.g. 25) • You may wish to provide the results in advance	Handout **BLM 3B-4: Cereal Need per Global Region Chart** Calculator needed

Slide	Teaching & Learning Strategies	Special Notes
15	• Using the results from slide 15, have students redistribute the cereal production in the world to meet the basic needs of the global population based on Canada's Food Guide • mt = millions of tonnes • Students can create larger icons as they go, but must delete the same amount from the board as they do so (i.e. can create a 500 mt icon, but must delete 5 x 100 mt icons) • There is a total of 2,246 mt of grain on the board (Therefore, in 2005, the globe produced 2,246 million tonnes of cereals) • Students at their desks can do the same exercise using the Grain Cutouts page and a World Map; use a full sized World Map or copy World Map to 11x17 paper	Optional Handouts **BLM 3B-5: Grain Cutouts** **BLM 3B-1: World Map** (11x17 paper) or any other large World Map you may have. At the end of the exercise, there will be 1,755 mt of cereals left over after redistribution
16	• After redistributing the cereal production in Slide 16, discuss the questions • Points of discussion: lack of adequate technologies, climate, poverty, global food prices • Discussion: What might the excess cereal be used for? Livestock, waste, other uses? • Sample video on population available on Youtube, link provided	
17	• Extension activities	

Final Reflection/Critique and Extension

Upon completion of some or all of the activities/slides above, students should discuss some of the political, social and economic impacts of population and food production. Students could divide into groups and create a chart on the political, social and economic challenges AND possible solutions for the future.
Students could then look at the "Active Citizenship" activities and conduct an action project that looks deeper into the issue of food and food security.

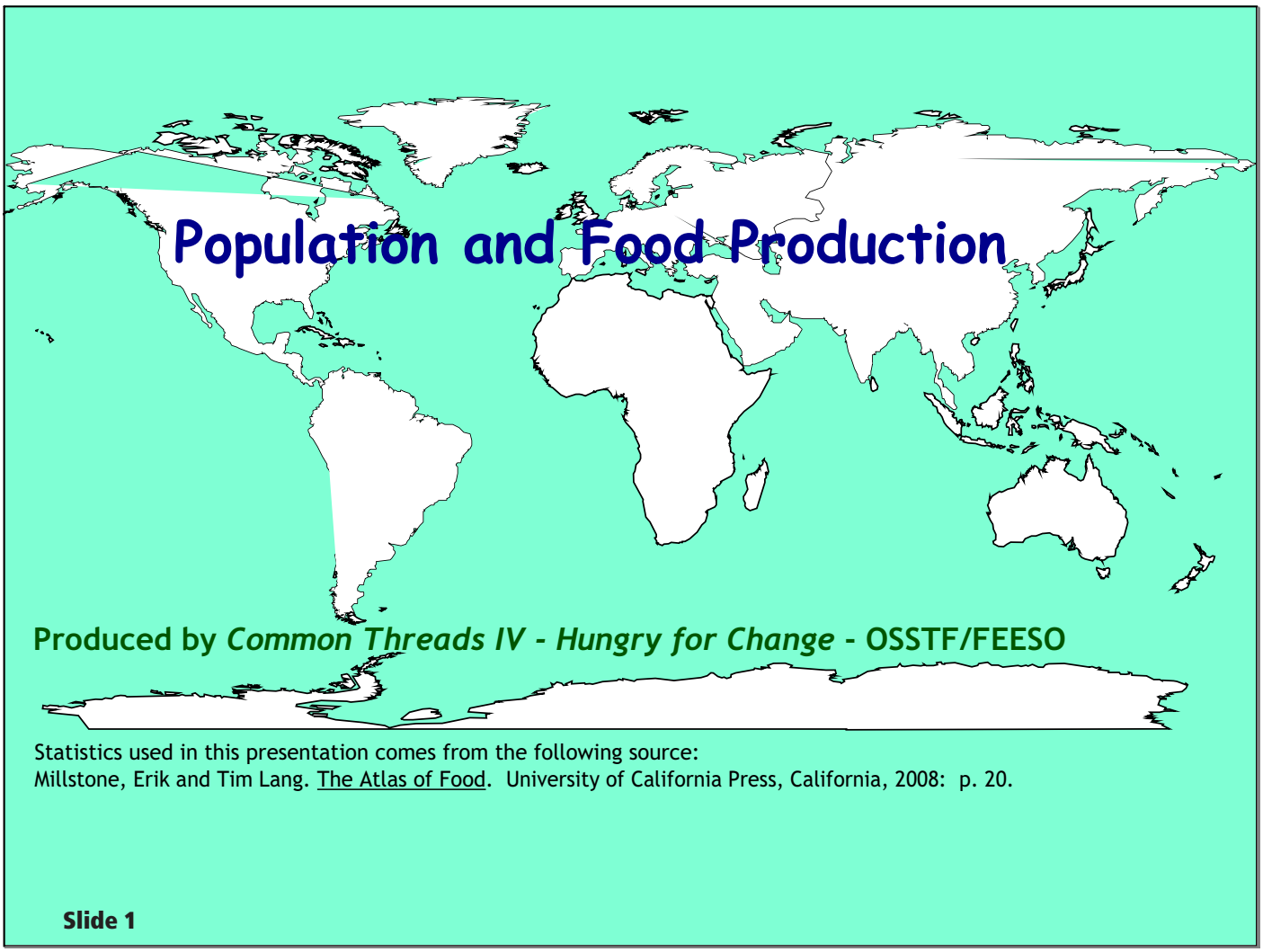
Special Instructions: Population and Food Production Notebook Lesson Plan

This lesson has been produced using Notebook 10 software produced by Smart Tech. Notebook 10 is for use on SMART Board products, but can be used with a regular LCD or data projector.

This lesson should load on an older version of Notebook software (i.e. Version 9.7), but may require add on software to operate, such as the Lesson Activity Toolkit 1.0. Some formatting may be affected by use on an older version. Please check the slides in advance of doing this lesson if using an older version of the Notebook software. This lesson also contains some video attachments that require a media player that will be able to run .flv and/or .mp4 files. The videos also have a hyperlink to Youtube. Hopefully, one of the files will work with your software. If you want an updated version of the Notebook Software (Version 10), go to www.smarttech.com and then visit the Downloads section. You will require a code key to download the software.

Tutorials from Smart Tech:

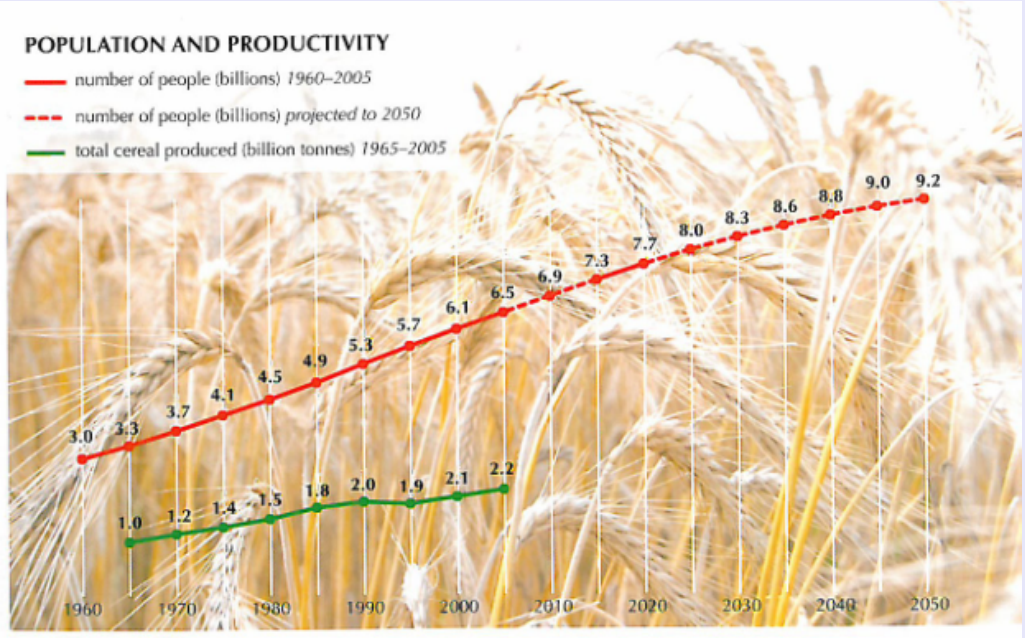
1. Go to www.smarttech.com
2. Click the "Training" link along the top toolbar
3. There are quick training videos under the "Free Training Materials" link. Explore some of the other links on the Training page.



Statistics used in this presentation comes from the following source:
Millstone, Erik and Tim Lang. The Atlas of Food. University of California Press, California, 2008: p. 20.

Slide 1

Fill in the remaining numbers below on the graph by estimating the trend of total cereal production from 2005 - 2050

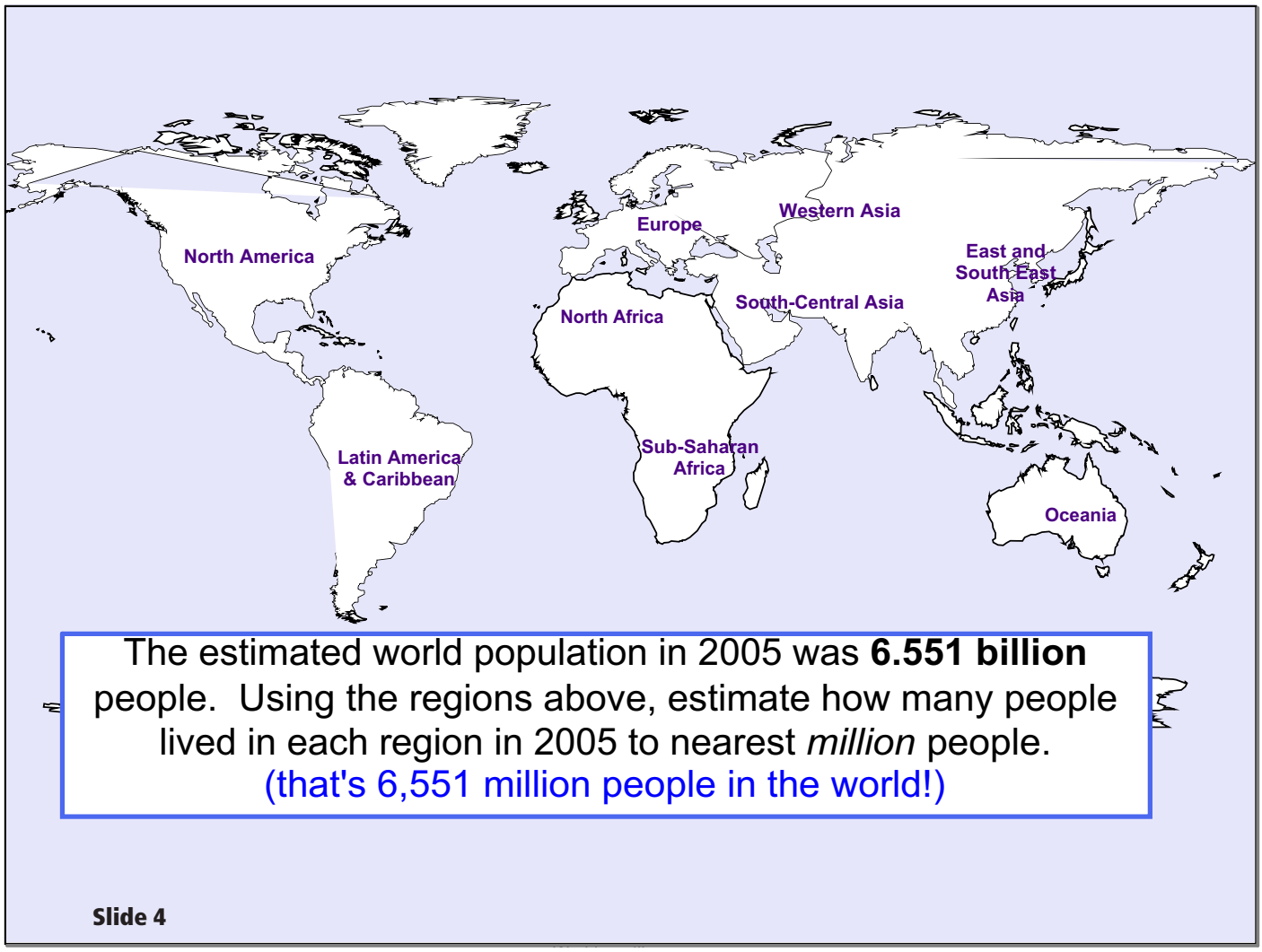


Source: Millstone, Erik and Tim Lang. The Atlas of Food. University of California Press, California, 2008: p. 20.

Slide 2

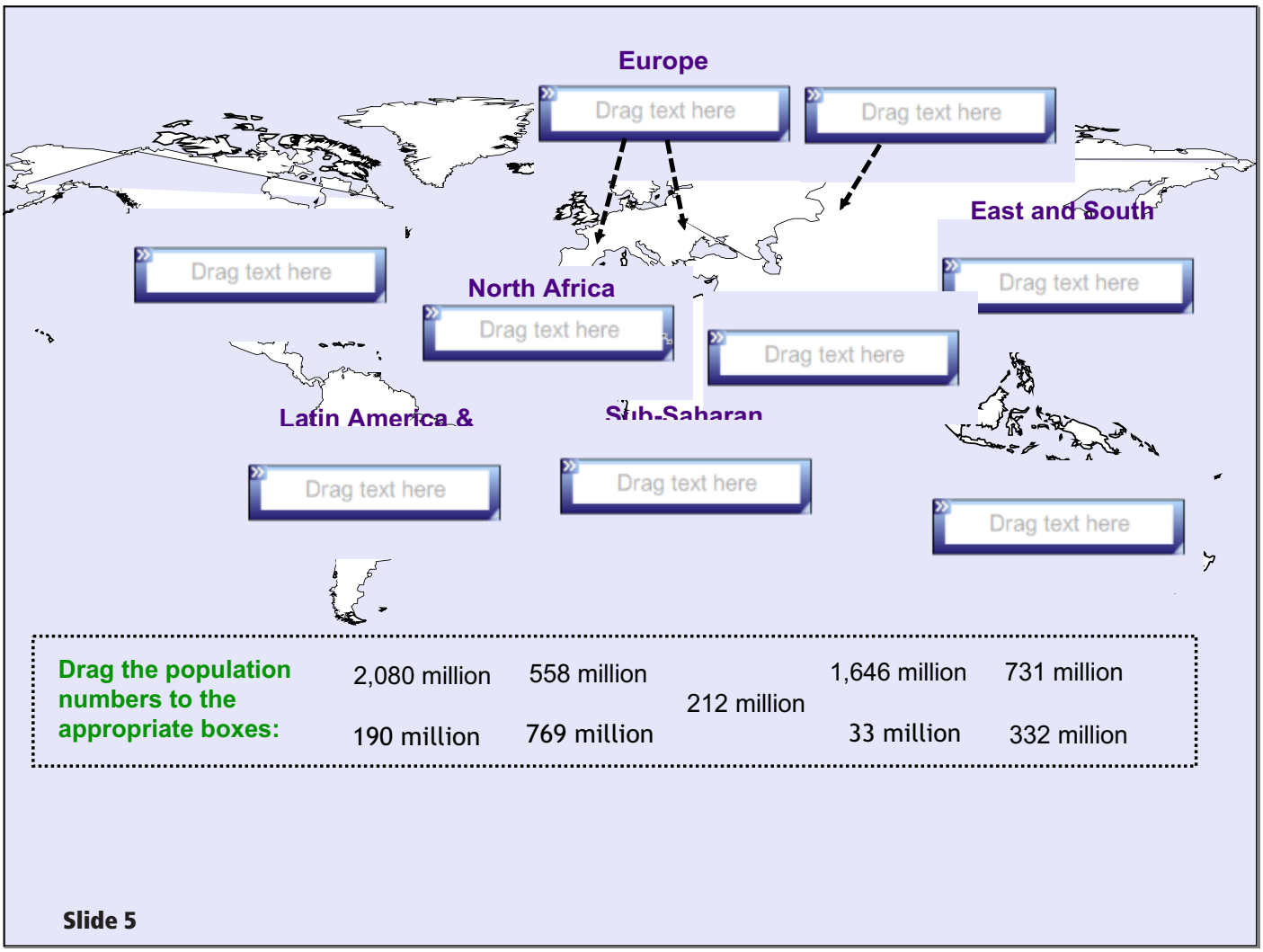
Based on the numbers you used to complete the chart, what general conclusions and consequences can you infer for the future?

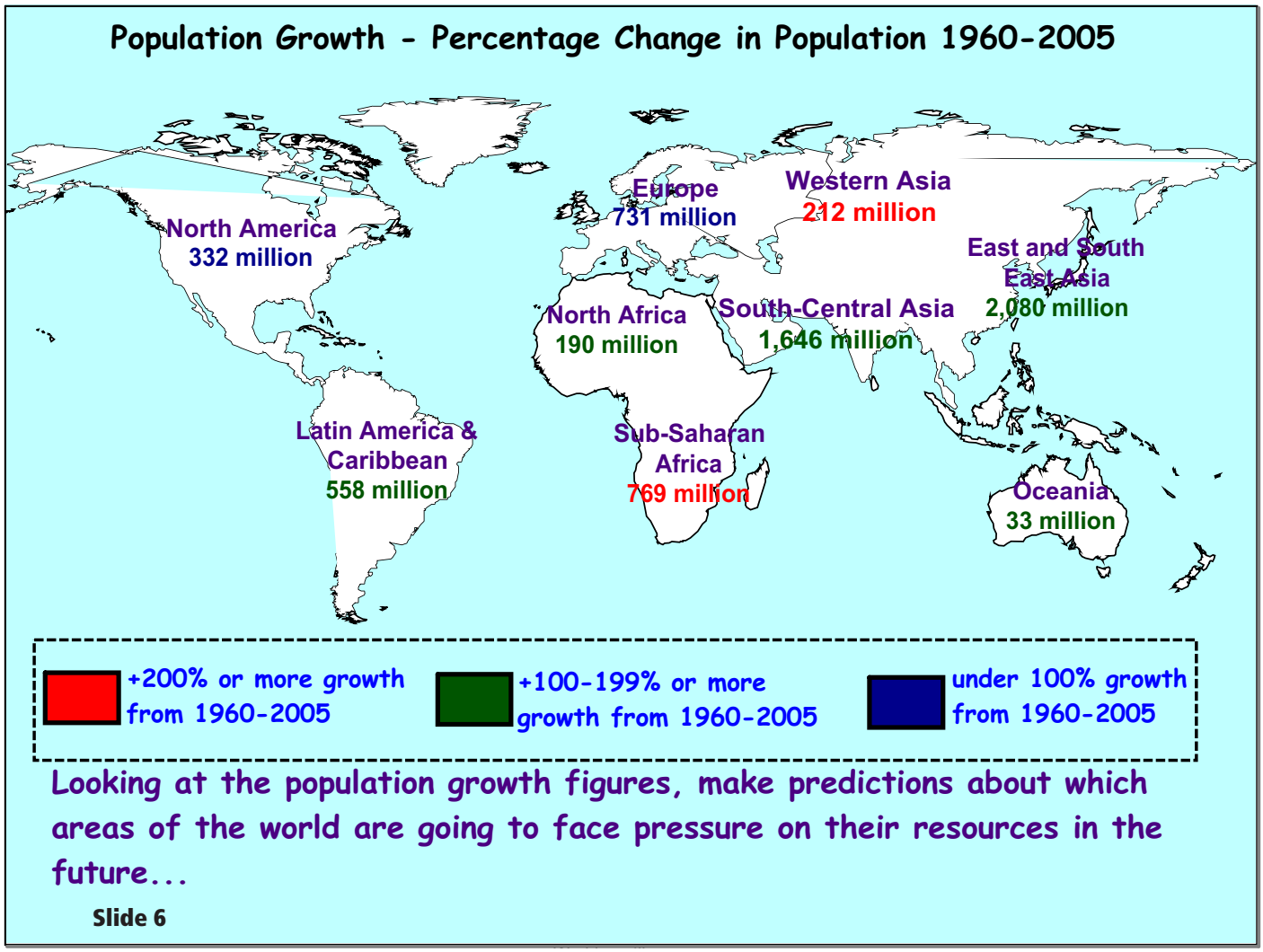
Slide 3

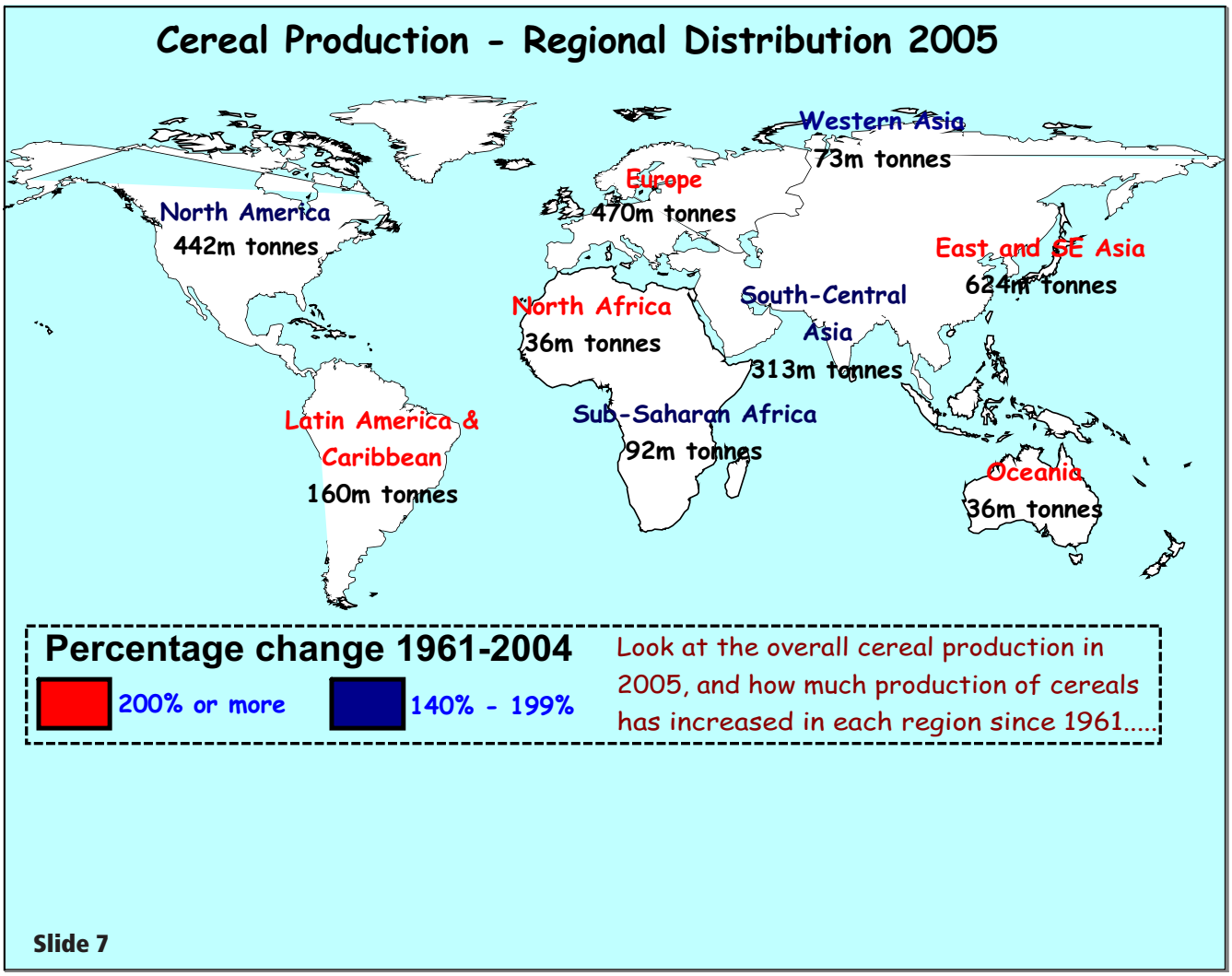


The estimated world population in 2005 was **6.551 billion** people. Using the regions above, estimate how many people lived in each region in 2005 to nearest *million* people.
(that's 6,551 million people in the world!)

Slide 4


Europe
Drag text here
Drag text here
East and South
Drag text here
Drag text here
North Africa
Drag text here
Drag text here
Latin America &
Sub-Saharan
Drag text here
Drag text here
Drag text here
Drag the population numbers to the appropriate boxes:
2,080 million
558 million
212 million
1,646 million
731 million
190 million
769 million
33 million
332 million
Slide 5


Population Growth - Percentage Change in Population 1960-2005
North America
332 million
Europe
731 million
Western Asia
212 million
East and South East Asia
2,080 million
North Africa
190 million
South-Central Asia
1,646 million
Latin America & Caribbean
558 million
Sub-Saharan Africa
769 million
Oceania
33 million
+200% or more growth from 1960-2005
+100-199% or more growth from 1960-2005
under 100% growth from 1960-2005
Looking at the population growth figures, make predictions about which areas of the world are going to face pressure on their resources in the future...
Slide 6


Cereal Production - Regional Distribution 2005
North America
442m tonnes
Europe
470m tonnes
Western Asia
73m tonnes
East and SE Asia
624m tonnes
South-Central
Asia
313m tonnes
North Africa
36m tonnes
Sub-Saharan Africa
92m tonnes
Latin America &
Caribbean
160m tonnes
Oceania
36m tonnes
Percentage change 1961-2004
200% or more
140% - 199%
Look at the overall cereal production in 2005, and how much production of cereals has increased in each region since 1961.....
Slide 7

Four Factors to Compare....

a) Population as of 2005
b) Population increase patterns over the last half century
c) Cereal (food) production as of 2005
d) Cereal production increase patterns over the last half century

Considering the above statistics and patterns, what issues may arise over the next 50 years when it comes to food and food distribution in various regions around the world???

Fill in your "Food Production and Speculation Matrix" as we go

Slide 8

Food Production and Population Speculation Matrix

	Production vs Population	Ability to Trade Surplus Food	Need to Trade to Get More Food
North America	- has enough food for population, will have enough over long term based on population growth		
Europe			- no pressure to obtain food from other sources
Oceania		- food production patterns show that they will likely have surplus food to trade for other goods	

Slide 9

Food Production and Population Speculation Matrix

	Production vs Population	Ability to Trade Surplus Food	Need to Trade to Get More Food
Latin America and Caribbean			
North Africa			
East and South East Asia			

Slide 10

Food Production and Population Speculation Matrix

	Production vs Population	Ability to Trade Surplus Food	Need to Trade to Get More Food
Sub-Saharan Africa			
Western Asia			
South Asia			

Slide 11

Based on your analysis, fit the regions of the world in the appropriate category...

Secure: Food production vs Population is sustainable	**Challenges:** Food production vs Population will face sustainability challenges	**Crisis:** Food production vs Population is near or at a crisis situation
North America	Europe Western Asia East and South East Asia	Latin America & Caribbean North Africa South-Central Asia Oceania Sub-Saharan Africa

Slide 12

Is there enough food???

It has been argued that there is enough food produced in the world for its current population. Yet, chronic malnutrition is epidemic in many parts of the world.

On the next slide, redistribute the food production (cereal) in the world to the global population so that everyone has an equal amount of food AND it is enough to meet basic needs.

The numbers used in this exercise are approximate values based on 2005 statistics

According to the Canada's Food Guide to Healthy Eating, the average adult would need 75kg of cereals and grains per year to meet a healthy, minimal diet.

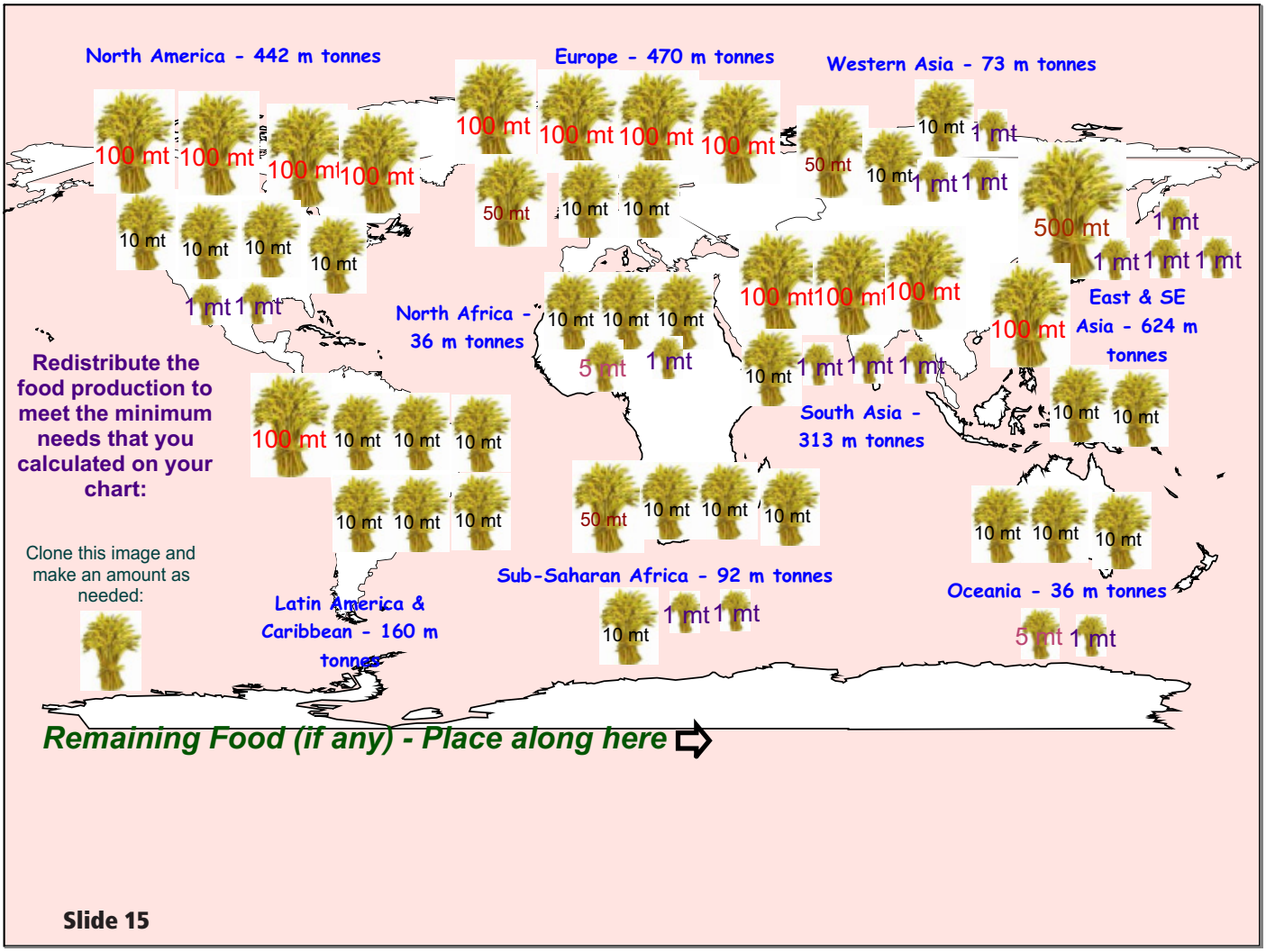
Slide 13

Using the population figures from earlier, how much cereal would be needed annually to meet the needs stated in Canada's Food Guide (based on 2005):

1,000kg = 1 metric tonne

Region	Population	Cereal Need per Person	Cereal Need (in millions of tonnes)
North America	332 million	75kg	24.9
Latin America & Caribbean	558 million	75kg	
Europe	731 million	75kg	
North Africa	190 million	75kg	
Sub-Sarharan Africa	769 million	75kg	
Western Asia	212 million	75kg	
South Asia	1,646 million	75kg	123.45
East & SE Asia	2,080 million	75kg	
Oceania	33 million	75kg	

Slide 14


North America - 442 m tonnes
Europe - 470 m tonnes
Western Asia - 73 m tonnes
North Africa - 36 m tonnes
East & SE Asia - 624 m tonnes
South Asia - 313 m tonnes
Sub-Saharan Africa - 92 m tonnes
Latin America & Caribbean - 160 m tonnes
Oceania - 36 m tonnes
Redistribute the food production to meet the minimum needs that you calculated on your chart:
Clone this image and make an amount as needed:
Remaining Food (if any) - Place along here
Slide 15

Based on your work redistributing the cereal food production of the world...

A) What conclusions can be drawn from the exercise about food production and distribution in the world?

B) What factors may influence the lower production of food in areas of high population (i.e., South-Central Asia, Sub-Saharan Africa)?

C) What role may agricultural technologies and access to those technologies have on the food production and distribution issue?

Video Resource on Agricultural Production

World Population - 7:31

Illustration of the growth of the world's population over time.

Youtube Link

Slide 16

Active Citizenship:

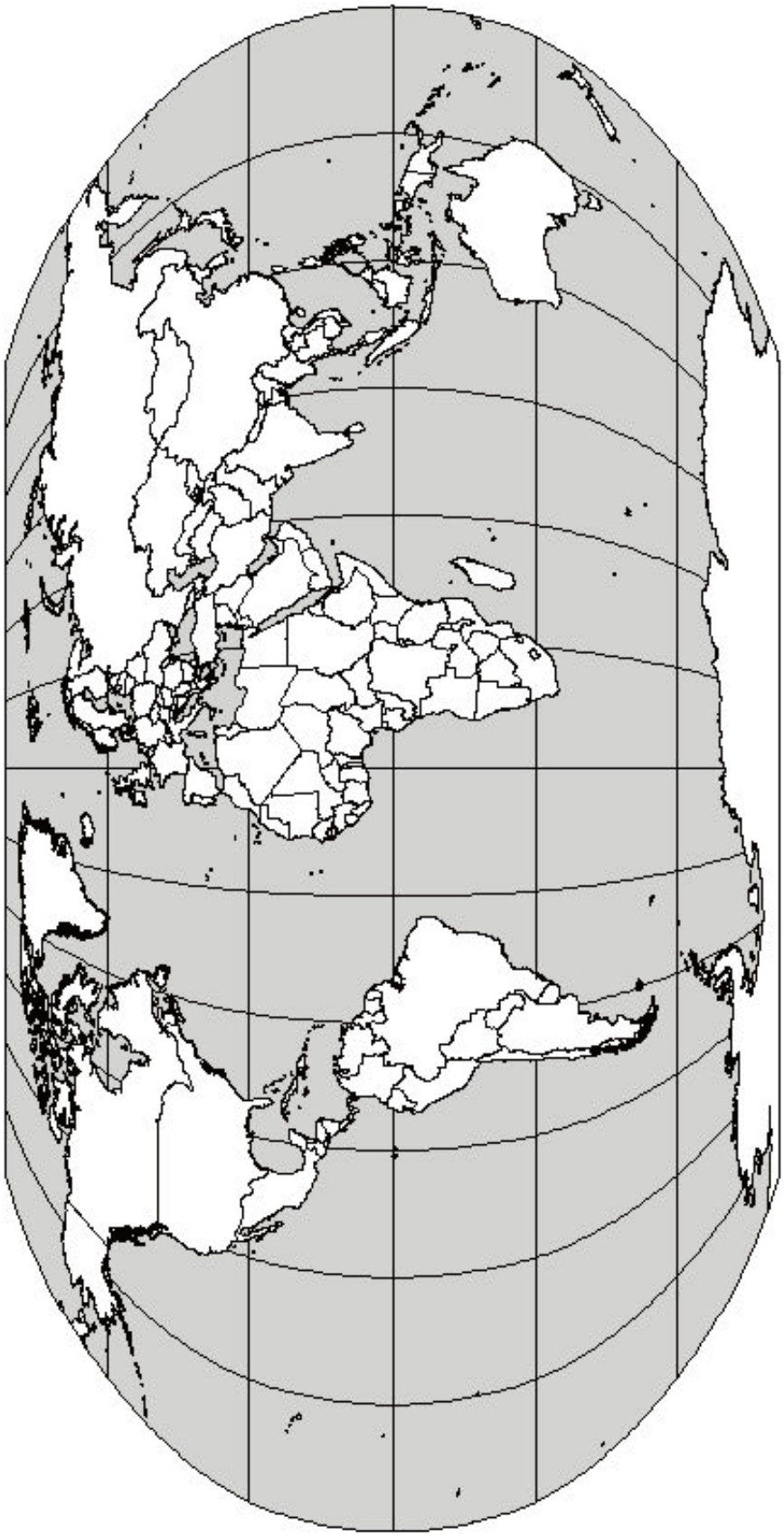
INVESTIGATE some organizations and charitable groups that work to improve farming technology and greater equality in food distribution around the world.

PARTICIPATE in an awareness campaign or lobbying your political leaders to address the issue of unequal food distribution and supporting the improvement of farming technologies in poorer nations.

DEBATE the issue of food distribution and trade in the world by discussing the solutions and greater challenges to these issues.

Slide 17

World Map



Population and Cereal Production

Fill in the following chart as you move through the lesson:

Region	Population	Population Increase from 1960-2005	Cereal Production	Cereal Production Increase from 1961-2004
North America				
Latin America & Caribbean				
Europe				
North Africa				
Sub-Saharan Africa				
Western Asia				
South Asia				
East & SE Asia				
Oceania				

Information Source: Millstone, Erik and Tim Lang. The Atlas of Food. University of California Press, California, 2008: p. 21.

Food Production and Speculation Matrix

Region	Production vs. Population	Ability to Trade Surplus Food	Need to Trade to Get More Food
North America			
Latin America & Caribbean			
Europe			
North Africa			
Sub-Saharan Africa			
Western Asia			
South Asia			
East & SE Asia			
Oceania			

Cereal Need Per Global Region Based on Canada's Food Guide

1,000kg = 1 metric tonne

Quick Formula Take the population number to the nearest million x 75 / 1,000

Example: North America: (332 x 75) / 1,000 = 24.9 million tonnes

Note: Round off your results to the nearest millions of tonnes

Region	Population	Cereal Need per Person	Cereal Need (in millions of tonnes)
North America	332 million	75kg	24.9 (25)
Latin America & Caribbean	558 million	75kg	
Europe	731 million	75kg	
North Africa	190 million	75kg	
Sub-Saharan Africa	769 million	75kg	
Western Asia	212 million	75kg	
South Asia	1,646 million	75kg	123.45 (123)
East & SE Asia	2,080 million	75kg	
Oceania	33 million	75kg	

Cereal Need Per Global Region Based on Canada's Food Guide—Solutions

Region	Population	Cereal Need per Person	Cereal Need (in millions of tonnes)
North America	332 million	75kg	24.9 (25)
Latin America & Caribbean	558 million	75kg	42
Europe	731 million	75kg	55
North Africa	190 million	75kg	14
Sub-Saharan Africa	769 million	75kg	58
Western Asia	212 million	75kg	16
South Asia	1,646 million	75kg	123.45 (123)
East & SE Asia	2,080 million	75kg	156
Oceania	33 million	75kg	2

Grain Cutouts

Cut out the following Cereal/Grain icons and amounts as needed for the Food Redistribution exercise. Remember: The maximum amount of cereal/grain you are to use and redistribute in the activity is 2,246 mt (millions of tonnes). There is less than 2,246 mt of grain represented in this handout. Make up some of your own amounts as needed with the blank icons below.

Estimated Time

3-5 lessons

Overall Expectations

By the end of these activities, the students will be able to:

- recognize the global pattern of caloric intake and import and export of food
- understand the limitations to food production and food security
- Identify food security indicators

Enduring Understandings

Students will gain an understanding of the inequity of food production and consumption and be able to identify the causes for this inequity.

Prior Learning

- Students should have a working knowledge of the global location of countries and some knowledge of the factors that influence the production and distribution of food.
- Students will use mapping skills to produce and analyze choropleth maps graduated colour. They should have prior experience producing choropleth (graduated colour) maps in ArcView or teachers can use the maps provided in a class presentation.
- Students should have an understanding of correlations to scatter graphs and determine the line of best fit.

Getting Ready

1. If students are completing the GIS labs, book adequate computer lab time. (recommend 1 to 2 classes). This will vary based upon the experience level of students using ArcView. Review how to complete a choropleth map using the ArcView instructions. You will need to make sure that the data base (food_table.txt) is placed on your network or in a handout folder so students can readily access the required statistics for the ArcView map.
2. The ArcView produced maps are also included as a PowerPoint file on the CD and could be projected for students using a data projector or Smartboard. The maps could also be printed from the PowerPoint file as handouts.
3. Several files that students need are included on the CD. Those that need to be included are listed at the appropriate place in the lesson plans.
4. Copy BLMs that are needed for each activity.

Teaching and Learning Strategies

Lesson 1—Arcview Mapping and Analysis: Calorie Amounts and Trade Balance

Estimated Time 1-2 classes

Option A

1. Students use ArcView to create maps and complete an analysis of calorie amounts and trade balance.
2. Provide students with the instructions and questions for analysis. If completing the Calorie Map, use BLM 3C-1. If completing Agricultural Trade Balance, use BLM 3C-2. Students can also complete the analysis found in the instructions on the graphic organizers provided (BLM 3C-3)

    BLM 3C-1 Arcview Instructions and analysis—Calorie Map of World
    BLM 3C-2 Arcview Instructions and analysis—Agricultural Trade Balance

Option B

Students analyze maps already created and included as BLMs given below.

1. Show the entire class the maps as a slide show (PowerPoint or SMARTBoard—attached on the CD as "Maps Analyzing Global food patterns.ppt)", or using the BLM Maps 3C-5, 3C-6, 3C-7, 3C-8, and have them complete the assigned questions on BLM 3C-3 and 3C-4.
2. Alternatively, place students in groups of 3 or 4 so that the group can briefly analyze the 4 maps. As a group, work to answer the assigned questions BLM 10.

    BLM 3C-3 Calorie Map of the World Analysis
    BLM 3C-4 Agricultural Trade Balance Maps Analysis
    BLM 3C-5 Map—Average daily supply of calories per person
    BLM 3C-6 Map—Agricultural Imports
    BLM 3C-7 Map—Agricultural Exports
    BLM 3C-8 Map—Net Agricultural Trade

Lesson 2 Statistical Analysis- (Scattergraphs and Correlational Analysis) Comparing GDP, caloric intake and workers engaged in agriculture)

Estimated Time 1-2 lessons

BLM 3C-9 Correlation Analysis—Data
BLM 3C-10A Correlation Analysis—Graph
BLM 3C-10B Correlation Analysis—Solutions
BLM 3C-11A Spearman Rank Data
BLM 3C-11B Spearman Rank—Solutions
BLM 3C-12 Correlation Analysis—Conclusions

This lesson provides several options for determining the type and strength of relationship between GDP, caloric intake and workers engaged in agriculture.

1. Provide the students with copies of the data or present an overhead copy of the data (GDP, caloric intake and percent of workers engaged in agriculture) BLM 3C-1. This data is also included as a spreadsheet file on the CD named—Correlational Analysis.xls. Provide this data file to the students if they are going to complete a computer-generated scattergraph or correlation using the computer.
2. Have the students look at the data in the table and ask them to predict what correlations they think

might exist between the variables included. Discuss the concept of independent and dependent variables.

3. Students should then select 2 variables and determine what type of correlation exists, if any, and the strength of that correlation. Students can generate scattergraphs (Option A), complete a correlation analysis (Option B), or do both. Students can complete 3 graphs/correlation analysis or they can work in groups of 3 and complete one of the graphs/correlation analysis then compare their results.
4. Once students have completed the graphs or statistical analysis they should complete the questions provided for overall analysis and predictions.

Option A
Using Scattergraphs to determine Correlations

You may wish to complete one example together as a class, then assign the others as independent work.

This activity can be done on paper or in a computer lab using a spreadsheet. If students are not familiar with spreadsheets and graphing, then you will need to show them how to do this, or provide them with a handout of instructions. They should place a 'line of best fit' on their graphs.

Alternatively, provide students with graph paper for graphing—this works best with a log scale for GDP—students may need some assistance initially with this type of scale. (BLM 3C-2A). If producing the graphs using a spreadsheet, advise students to use a log scale for the GDP. The data is included on the CD in the file named Correlation Analysis.xls.

Completed graphs (BLM 3C-2B) are included. If time is at a premium, these may be used for analysis as a whole class, or reproduced for students to analyse individually without having students create them.

Option B
Calculating Correlations Using Spearman's Rank or Linear Correlation

Two options are available for calculating correlations (type and strength) mathematically—Spearman's Rank (if calculating by hand on paper) or a Linear correlation (using a spreadsheet and computer).

If students are new to correlations and calculating correlations using a spreadsheet, you may wish to complete one correlation together to model how to complete it, then assign the students a second correlation to be completed independently.

Option A

Spearman's Rank (on paper, by hand. See BLM 3C-3A)

Step 1. Rank the order of data for each of the two variables being tested.

Step 2. Find the difference in the rankings (d)

Step 3. Square the differences. (d^2)

Step 4. Find the sum of the squares (Σd^2)

Step 5. Substitute $\Sigma d2$ and n (number of countries) into the formula

$$\text{Spearman's Rank} = 1 - \frac{6\,\Sigma d2}{n(n2-1)}$$

*Solutions are included on BLM 11B.

Option B

Linear Analysis (spreadsheet generated)

Have students complete this using the data in an appropriate spreadsheet. Use the 'correlation' function to calculate the value.

Interpretation of Correlation Data

Once the graphing and/or correlation analysis is complete, have the students summarize their findings using the organizer and questions found on BLM 3C-12. Students can determine type of relationship and strength from both the graphs and data.

Review with students that:

For Graphs and line of best fit:

- If the slope is upwards to the right = positive (+) correlation (as one variable increases so does the other)
- If the slope is downwards to the right = negative (-) correlation (as one variable increases, the other decreases)
- If values are generally close to the line, then the correlation shows a strong relationship.

For Spearman Rank and Linear Correlation:

Both methods of finding Correlations, final values will range from between -1.0 and +1.0.

Value of correlation	Zero	Between zero and +1	Between Zero and -1
Meaning	no correlation exists	• +1 means perfect direct* relation • the closer to 1, the stronger the relationship (between 0.5 and 1 will be strong)	• 1 means perfect indirect** relation • the closer to -1, the stronger the relationship (between -0.5 and -1 will be strong)

*Direct—as one variable increases the other also increases

**Indirect—as one variable increases the other decreases

Lesson 3—Monitoring Progress towards Hunger Reduction: FAO Country Comparisons

Estimated Time 1 class

BLM 3C-13A to 13E **FAO Fact sheets**

This lesson provides students with the opportunity to compare the success of countries in their progress towards hunger reduction.

Complete the team analysis activity that is described below. Provide students with copies of the fact sheets (BLM 3C-13A to E), or use the FAO website link to select countries of your choice or have students select a country and go to the FAO website to select the required fact sheet. These are also included as PDF's as part of the CD—in the folder FAO Fact Sheets.

The current Internet link (Spring 2009) is: *http://www.fao.org/faostat/foodsecurity/MDG_en.htm*

Team Analysis
Use this activity as a means to introduce students to the types of statistics collected and reported on about hunger as well as giving them an opportunity to compare countries and the challenges that they face.

Steps:

1. Put students into groups of 4, provide each group (one country per student) with the fact sheets on Brazil, India, Haiti, Vietnam and Sudan (or those of your choosing from FAO Food Statistics website) and ask them to read over the information individually, then summarize it to their group.
2. Have the students discuss in their group what was the most important piece of information about each country that emerged from reading the information.
3. Randomly select a student from one group to report on what the group decided.
   Provide the group with a grade that represents their level of thinking. (scale of 1-4 based on accuracy of response, complexity of response and originality of insight). Do not provide the students with the criteria for your mark. Their task is to determine the criteria by listening to one another.
4. Have the other teams prepare a response to what was presented. Another group is then selected to disagree, accept or extend the thinking of the first group. Again, provide a mark, this time providing some rationale for the mark related to the quality of the contribution.
5. After another 2-3 groups have shared, give them time to rethink their original idea by re-examining their initial ideas, or merge it with the author's, teacher's or other student's thinking.
6. Once all teams have responded and the topic is clarified and the assessment criteria is shared, then begin a second round of discussion. Have them brainstorm to identify some reasons for why they think each country's progress is the way that it is. They should use atlases and textbooks to determine some of the limitations to agricultural production and supply of food—physical, political, economic, trading partners, etc. could be considered.
   (See *Beyond Monet* by Barrie Bennett and Carol Rolheiser, pages 320-324, for additional information on Team Analysis)

ArcView Mapping Activities—Calorie Map of the World

A. Creating your map:

1. Open a new project with a new view in ArcView. Add a new theme to your project by navigating to the appropriate folder and adding the countries of the world. Turn the theme on. Save your project as "Calories." Don't forget to save your project frequently as you work.
2. Click on the Window menu and select "Calories.apr." Click Tables and Add. Change "List files of type" to "Delimited text (*.txt)." Navigate to the appropriate folder and add "food_table.txt."
3. Click the column header that says "Fips_cntry." Notice that it is now a darker shade.
4. From the Window menu select "View1." Click on the "Open Theme Table" icon. Click the column header that says "Fips_cntry." Finally, click the "Join" icon. The two tables should now be joined together.

   *Note: If, when you open, your theme table there is no column headed "Fips_cntry," you can follow steps 3 and 4 but by selecting the column header "Gmi_cntry" instead.
5. From the Window menu select "View1." Double-click on the country theme in the legend at left in order to open the Legend Editor.
6. For "Legend Type" select "Graduated Color." For "Classification Field" select "Calories." Click on the "Classify" button. For "Type" select "Quantile"—this will put an equal number of countries into each category. For "Number of classes" select "4." Click "OK."
7. You will notice that the first category has a value of "-99." This is a place holder that ArcView uses when there is no data available. Double-click the symbol for "-99" and change the colour to light gray. Double-click where is says "-99" in the "Label" column. Type "No Data" in its place. Finally, click "Apply" and close the Legend Editor.
8. Click on the "Theme Properties" icon. Change the name of this theme to "Calories."
9. From the View menu select "Properties." Change the name of this view to "Calories." Click "OK."
10. From the View menu select "Layout." Select "Landscape." Double-click on the title to change it to "Average daily supply of calories per person." Double-click on the scale to change the units to kilometres. Re-size and re-position map components as needed. Print your layout.

ArcView Mapping Activities—Calorie Map of the World

B. Map Analysis:

1. Describe the pattern shown by your map. What regions have a high, medium and low supply of calories?
2. Why do you think this pattern exists? What human and natural factors play a role in the distribution of caloric availability? Use atlases or your textbook to help you answer this question.
3. What anomalies exist on your map? Anomalies are countries that don't fit the pattern you observed above. Remember that countries with "No Data" are not anomalies.
4. Why do you think these anomalies exist? What makes these countries different from their neighbours? Use atlases or your textbook to help you answer this question.
5. Complete the following chart in order to list the factors that limit or enhance the caloric availability.

Categories	Factors
Landforms	
Climate	
Soils	
Social	
Economic	
Political	
Cultural	

ArcView Mapping Activities—Agricultural Trade Balance

A. Creating your maps:

1. Open a new project with a new view in ArcView. Add a new theme to your project by navigating to the appropriate folder and adding the countries of the world. Turn the theme on. Save your project as "Trade." Don't forget to save your project frequently as you work.
2. Click on the Window menu and select "Trade.apr." Click Tables and Add. Change "List files of type" to "Delimited text (*.txt)." Navigate to the appropriate folder and add "food_table.txt."
3. Click the column header that says "Fips_cntry." Notice that it is now a darker shade.
4. From the Window menu select "View1." Click on the "Open Theme Table" icon. Click the column header that says "Fips_cntry." Finally, click the "Join" icon. The two tables should now be joined together.
   *Note: If, when you open, your theme table there is no column headed "Fips_cntry," you can follow steps 3 and 4 but by selecting the column header "Gmi_cntry" instead.
5. From the Window menu select "View1." Double-click on the country theme in the legend at left in order to open the Legend Editor.
6. For "Legend Type" select "Graduated Color." For "Classification Field" select "Food_imports." Click on the "Classify" button. For "Type" select "Quantile"—this will put an equal number of countries into each category. For "Number of classes" select "5." Click "OK."
7. You will notice that the first category has a value of "-99." This is a place holder that ArcView uses when there is no data available. Double-click the symbol for "-99" and change the colour to light gray. Double-click where is says "-99" in the "Label" column. Type "No Data" in its place. Finally, click "Apply" and close the Legend Editor.
8. Click on the "Theme Properties" icon. Change the name of this theme to "Imports ($1000)."
9. From the View menu select "Properties." Change the name of this View to "Imports." Click "OK."
10. Click once on the "Imports" theme in your legend. From the Edit menu select "Copy themes." From the Window menu select "trade.apr." Click "Views" and "New." From the Edit menu select "Paste."
11. Double-click on the country theme in the legend at left in order to open the Legend Editor. Repeat steps 6 through 9. This time in step 6 select "Food_exports," in step 7 choose a different monochromatic colour ramp, in step 8 name the theme "Exports ($1000)" and in step 9 name the view "Exports."
12. Click once on the "Exports" theme in your legend. From the Edit menu select "Copy themes." From the Window menu select "trade.apr." Click "Views" and "New." From the Edit menu select "Paste."
13. Double-click on the country theme in the legend at left in order to open the Legend Editor. Repeat steps 6 through 9. This time in step 6 select "Food_net_trade," in step 7 choose a different monochromatic colour ramp (and you will notice the place holder is "-999999999"), in step 8 name the theme "Net Trade ($1000)" and in step 9 name the view "Net Trade."
14. From the Window menu select "Imports." From the View menu select "Layout." Select "Landscape." Double-click on the title to change it to "Agricultural Imports." Double-click on the scale to change the units to kilometres. Re-size and reposition map components as needed. Print your layout.
15. Repeat step 14, choosing "Exports" for your view and changing the title on the layout to "Agricultural Exports."
16. Repeat step 14, choosing "Net Trade" for your view and changing the title on the layout to "Net Agricultural Trade."

ArcView Mapping Activities—Agricultural Trade Balance

B. Map Analysis:

1. Complete the following chart by describing the patterns shown by each map, discussing the role played by human and natural factors in the patterns, and by listing anomalies and explaining why they might exist.

	Imports	Exports	Net Trade
Describe the pattern			
Role of human factors in the pattern			
Role of natural factors in the pattern			
Anomalies			
Reasons for the anomalies			

ArcView Mapping Activities—Agricultural Trade Balance

B. Map Analysis:

2. Complete the following chart to compare the Imports and Exports maps.

Similarities	
Reasons for the similarities	
Differences	
Reasons for the differences	

3. Complete the following chart to compare the Imports and Exports maps with the Net Trade map.

Similarities	
Reasons for the similarities	
Differences	
Reasons for the differences	

ArcView Mapping Activities—Agricultural Trade Balance

B. Map Analysis:

4. Complete the following chart in order to list the factors that limit or enhance the availability of food.

Categories	Factors
Landforms	
Climate	
Soils	
Social	
Economic	
Political	
Cultural	

Calorie Map of the World Analysis

Calorie Map of the World: Analysis

1. Describe the pattern shown by your map. What regions have a high, medium and low supply of calories?

2. Why do you think this pattern exists? What human and natural factors play a role in the distribution of caloric availability? Use atlases or your textbook to help you answer this question.

3. What anomalies exist on your map? Anomalies are countries that don't fit the pattern you observed above. Remember that countries with "No Data" are not anomalies.

4. Why do you think these anomalies exist? What makes these countries different from their neighbours? Use atlases or your textbook to help you answer this question.

5. Complete the following chart in order to list the factors that limit or enhance the caloric availability.

Categories	Factors
Landforms	
Climate	
Soils	
Social	
Economic	
Political	
Cultural	

Agricultural Trade Balance Maps of the World Analysis

1. Complete the following chart by describing the patterns shown by each map, discussing the role played by human and natural factors in the patterns, and by listing anomalies and explaining why they might exist.

	Imports	Exports	Net Trade
Describe the pattern			
Role of human factors in the pattern			
Role of natural factors in the pattern			
Anomalies			
Reasons for the anomalies			

Agricultural Trade Balance Maps of the World Analysis

2. Complete the following chart to compare the Imports and Exports maps.

Similarities	
Reasons for the similarities	
Differences	
Reasons for the differences	

3. Complete the following chart to compare the Imports and Exports maps with the Net Trade map.

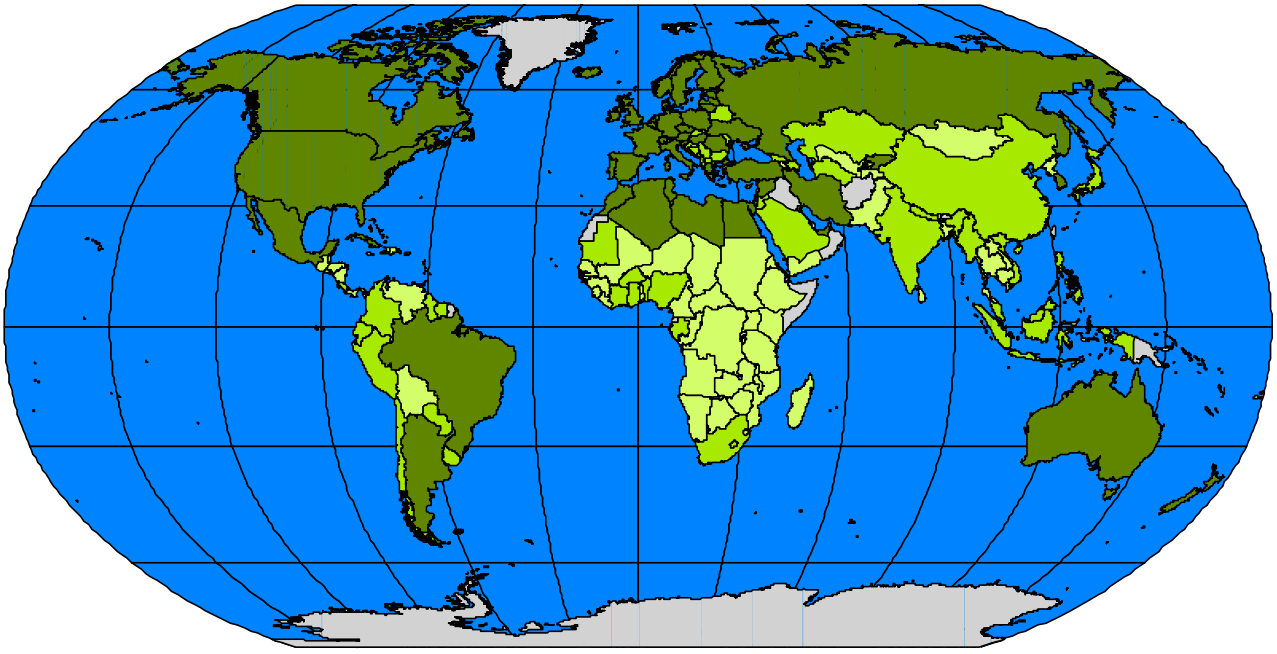
Similarities	
Reasons for the similarities	
Differences	
Reasons for the differences	

Agricultural Trade Balance Maps of the World Analysis

4. Complete the following chart in order to list the factors that limit or enhance the availability of food.

Categories	Factors
Landforms	
Climate	
Soils	
Social	
Economic	
Political	
Cultural	

Average daily supply of calories per person



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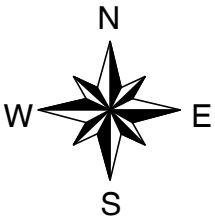
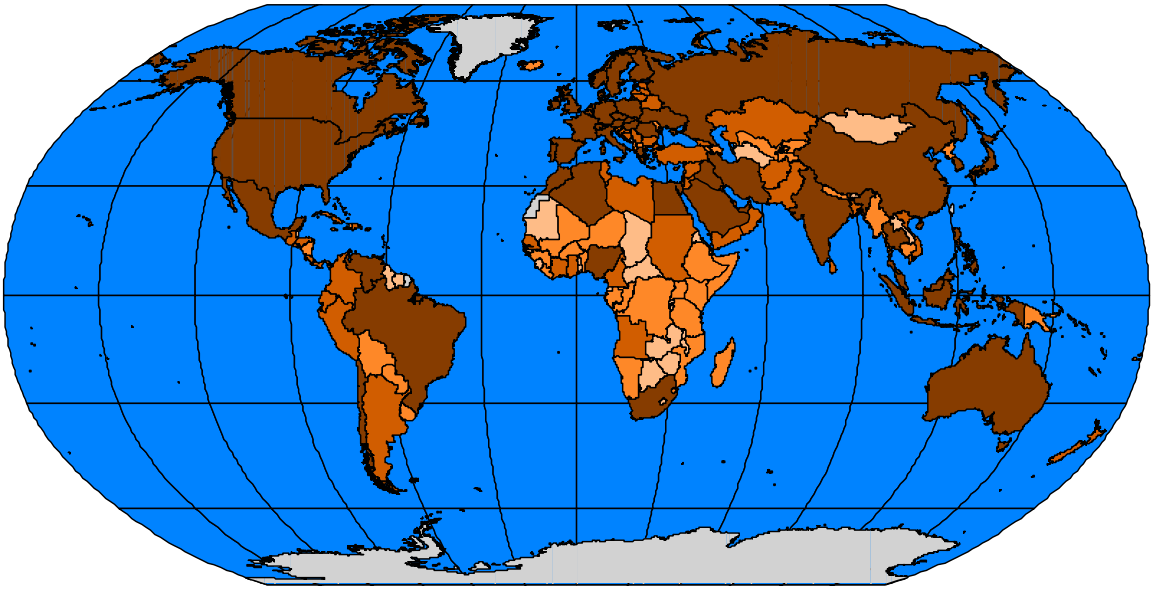


Calories
- No Data
- 1520 - 2420
- 2440 - 2960
- 2970 - 3770
- Oceans

Agricultural Imports



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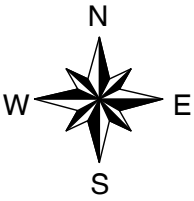
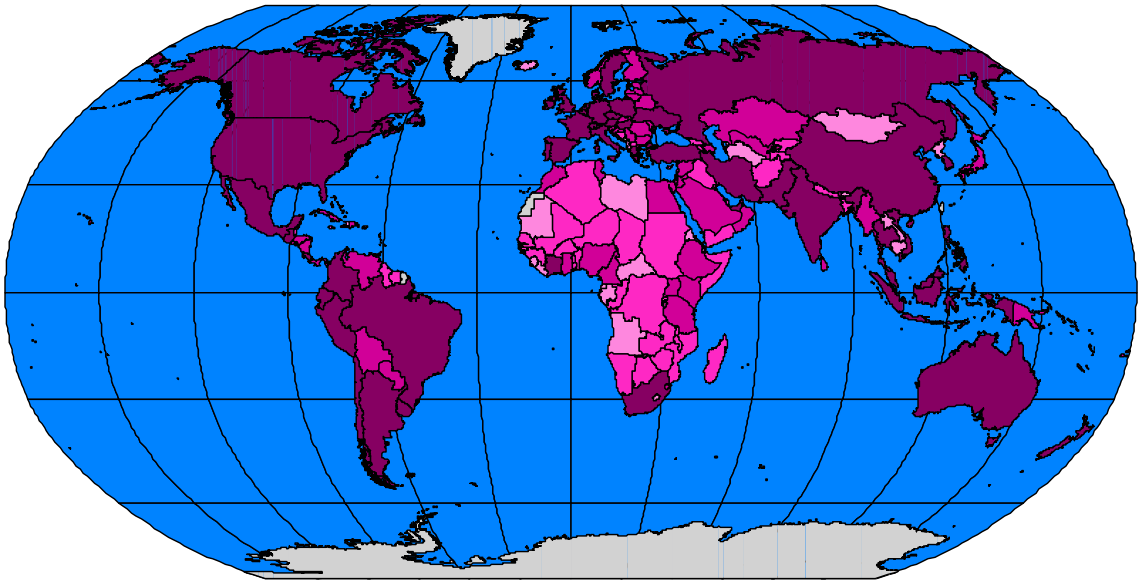


Agricultural Imports (US$1000)
- No Data
- 385 - 122532
- 122755 - 401142
- 416298 - 1515653
- 1551484 - 39314257
- Oceans

Agricultural Exports



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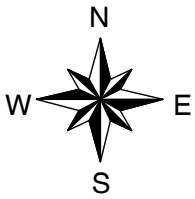
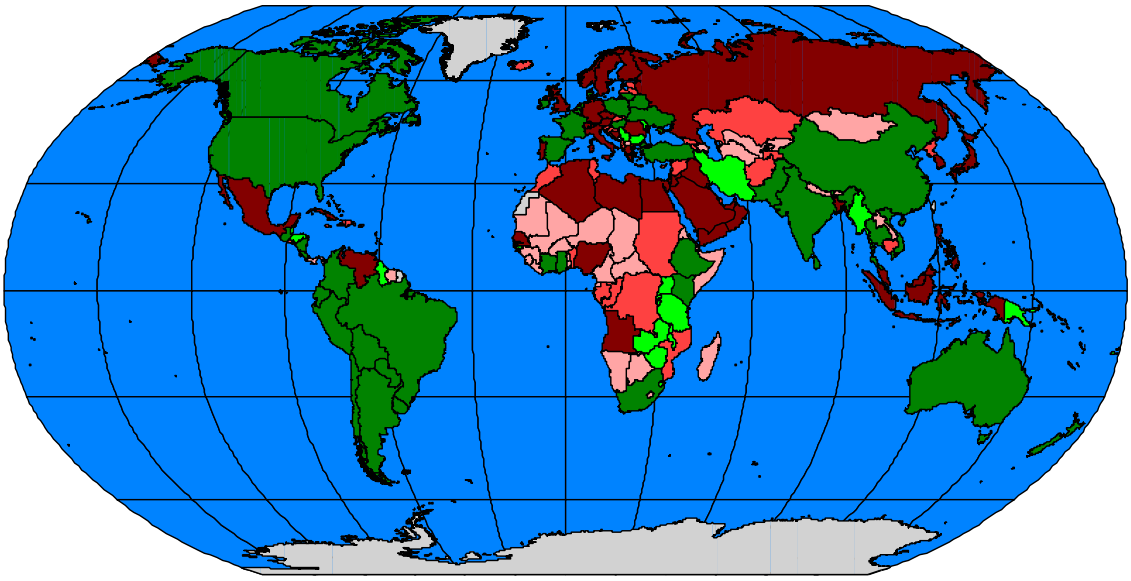


Agricultural Exports (US$1000)
- No Data
- 0 - 19838
- 21335 - 195044
- 196326 - 1190242
- 1248770 - 43992763
- Oceans

Net Agricultural Trade



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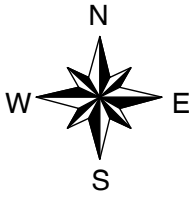
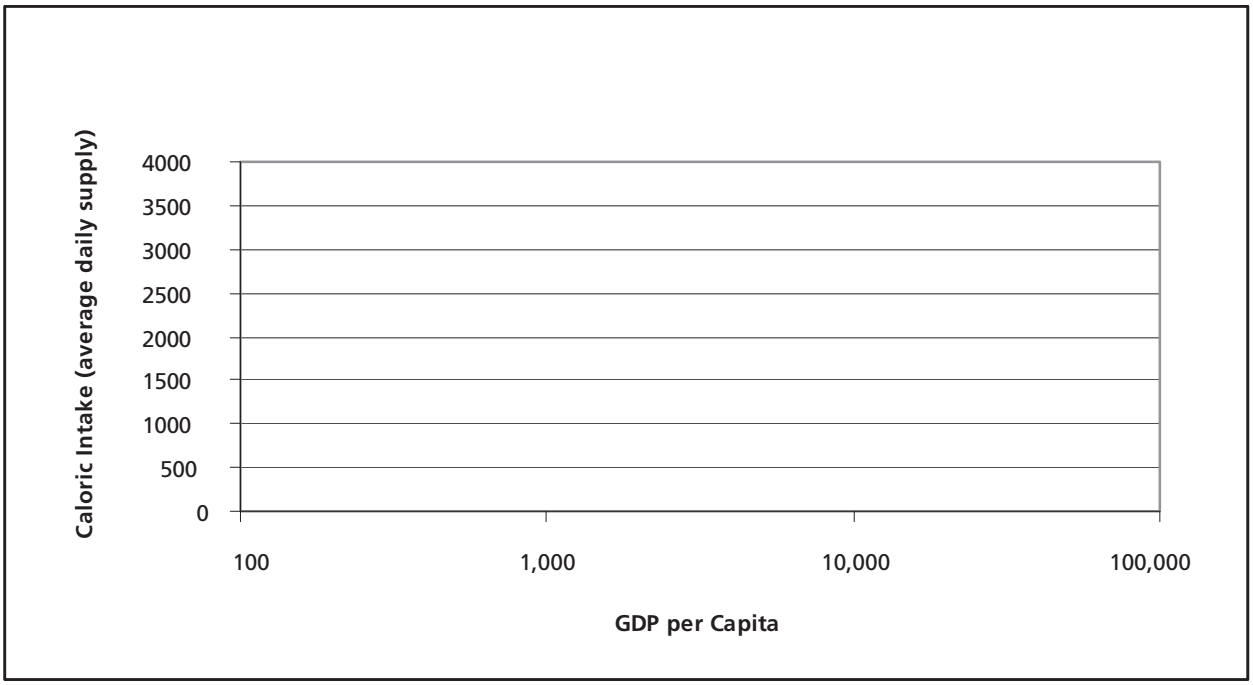


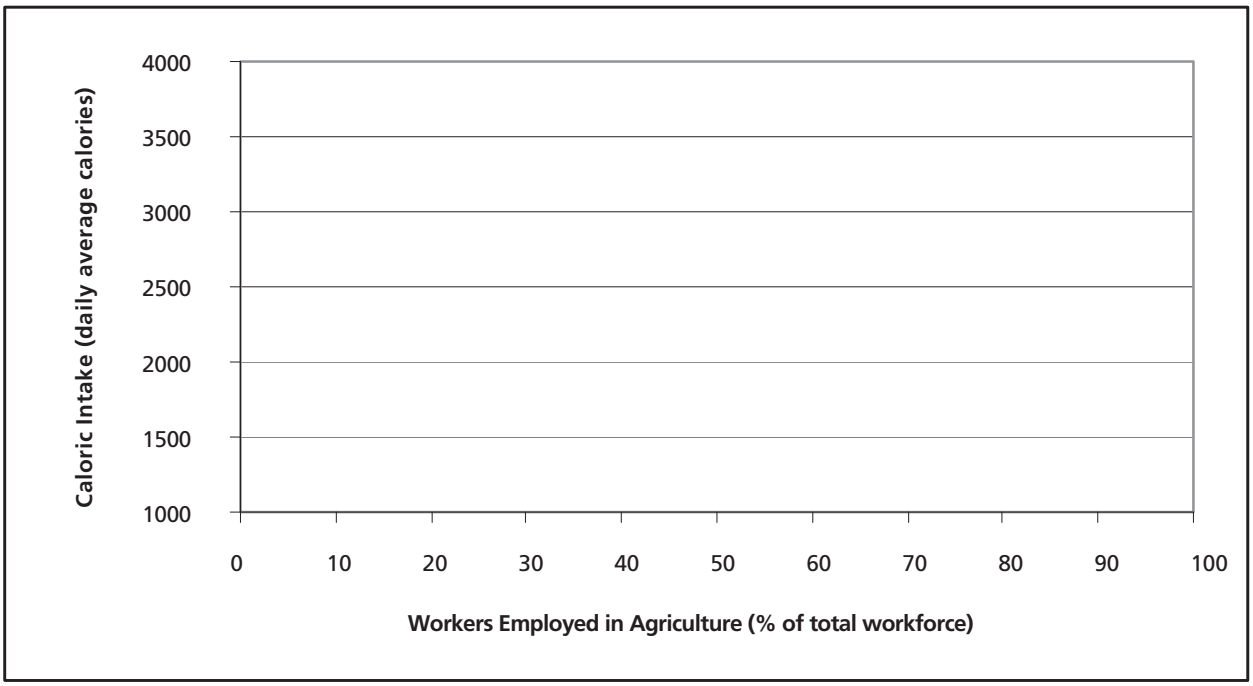
Net Agricultural Trade (US$1000)
- No Data
- -29018865 - -584961
- -547245 - -170113
- -166003 - 0
- 0 - 102535
- 140340 - 18965486
- Oceans

Correlation Analysis—Data

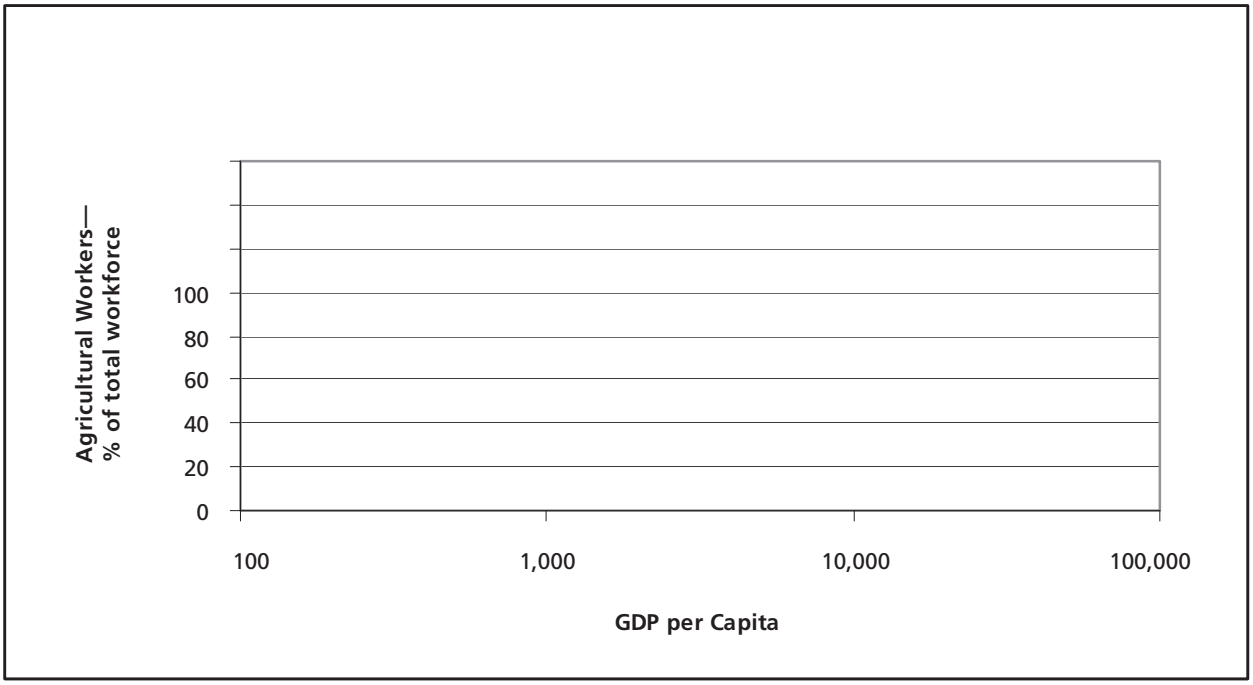
	Country	GDP per capita	Calories—average daily supply per person 2001-03	Agricultural Workers—% of total workforce—2010 projection
1	Argentina	14,500	2980	8
2	Austria	39,600	3740	3
3	Belgium	38,300	3640	1
4	Brazil	10,300	3060	12
5	Burundi	400	1640	89
6	Cambodia	2,100	2060	66
7	Canada	40,200	3590	2
8	Central African Republic	700	1940	63
9	Chile	15,400	2860	13
10	China	6,100	2940	61
11	Cuba	12,700	3190	11
12	Eritrea	700	1520	74
13	Ethiopia	800	1860	78
14	France	32,700	3640	2
15	India	2,900	2440	55
16	Ireland	47,800	3690	7
17	Israel	28,900	3680	2
18	Italy	31,000	3670	3
19	Japan	35,300	2770	2
20	Liberia	500	1940	62
21	Luxembourg	85,100	3710	1
22	Nepal	1,000	2450	92
23	North Korea (DPRK)	1,800	2160	23
24	Peru	8,500	2570	26
25	Portugal	22,000	3750	9
26	Sierra Leone	700	1930	57
27	Tajikistan	1,800	1840	27
28	Tanzania	1,400	1960	76
29	United States	48,000	3770	2
30	Zambia	1,500	1930	63

Correlation Analysis—Graph

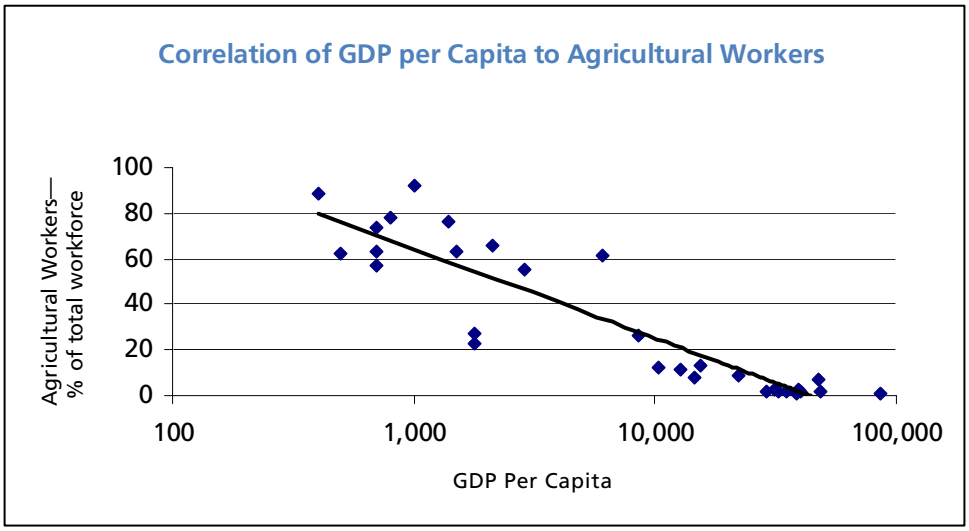


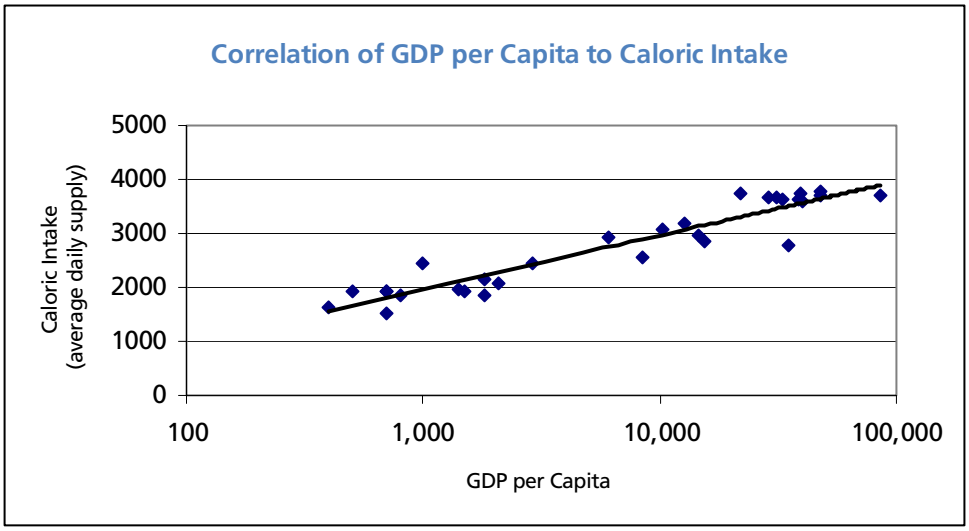


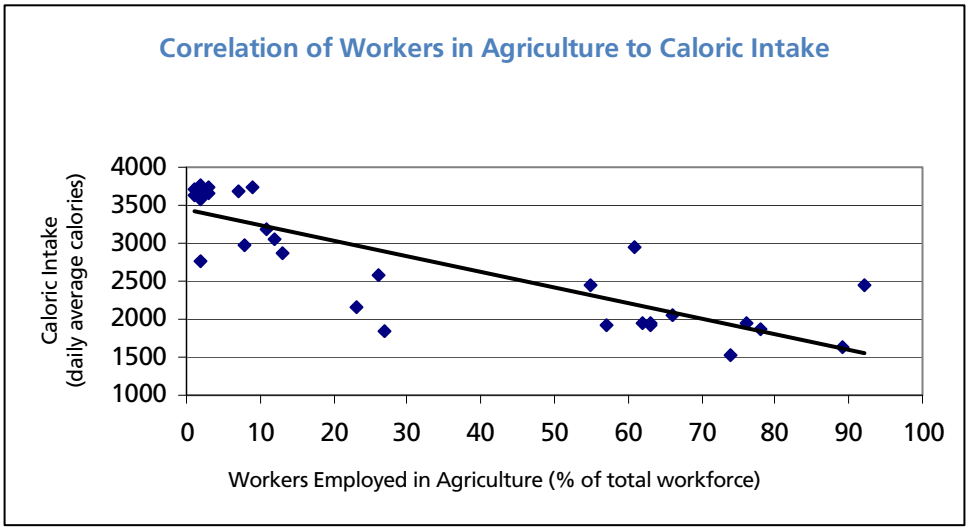
Correlation Analysis—Graph



Correlation Analysis—Solutions







Spearman Rank—Data

		GDP Per Capita		Calories		GDP to Calories		Agricultural Workers		GDP to Agricultural Workers		Calories to Agricultural Workers	
	Country	**GDP per capita**	**Rank of GDP**	**Calories —average daily supply per person 2001–03**	**Rank of Calories**	**Difference in Rank**	**Difference Squared**	**Agricultural Workers—% of total workforce—2010 projection**	**Rank of Agricultural workers**	**Difference of Rank**	**Difference Spread**	**Difference of Rank**	**Difference Spread**
1	Argentina	14,500		2980				8					
2	Austria	39,600		3740				3					
3	Belgium	38,300		3640				1					
4	Brazil	10,300		3060				12					
5	Burundi	400		1640				89					
6	Cambodia	2,100		2060				66					
7	Canada	40,200		3590				2					
8	Central African Republic	700		1940				63					
9	Chile	15,400		2860				13					
10	China	6,100		2940				61					
11	Cuba	12,700		3190				11					
12	Eritrea	700		1520				74					
13	Ethiopia	800		1860				78					
14	France	32,700		3640				2					
15	India	2,900		2440				55					
16	Ireland	47,800		3690				7					
17	Israel	28,900		3680				2					
18	Italy	31,000		3670				3					
19	Japan	35,300		2770				2					
20	Liberia	500		1940				62					
21	Luxembourg	85,100		3710				1					
22	Nepal	1,000		2450				92					
23	North Korea (DPRK)	1,800		2160				23					
24	Peru	8,500		2570				26					
25	Portugal	22,000		3750				9					
26	Sierra Leone	700		1930				57					
27	Tajikistan	1,800		1840				27					
28	Tanzania	1,400		1960				76					
29	United States	48,000		3770				2					
30	Zambia	1,500		1930				63					
	SUM												

Correlation Analysis—Solutions

		GDP Per Capita		Calories		GDP to Calories		Agricultural Workers		GDP to Agricultural Workers		Calories to Agricultural Workers	
	Country	**GDP per capita**	**Rank of GDP**	**Calories—average daily supply per person 2001–03**	**Rank of Calories**	**Difference in Rank**	**Difference Squared**	**Agricultural Workers—% of total workforce—2010 projection**	**Rank of Agricultural workers**	**Difference of Rank**	**Difference Spread**	**Difference of Rank**	**Difference Spread**
1	Argentina	14,500	13	2980	13	0	0	8	20	-7	49	-7	49
2	Austria	39,600	5	3740	3	2	4	3	22	-17	289	-19	36
3	Belgium	38,300	6	3640	9	-3	9	1	29	-23	529	-20	40
4	Brazil	10,300	15	3060	12	3	9	12	17	-2	4	-5	25
5	Burundi	400	30	1640	29	1	1	89	2	28	784	27	72
6	Cambodia	2,100	19	2060	21	-2	4	66	6	13	169	15	22
7	Canada	40,200	4	3590	10	-6	36	2	24	-20	200	-14	19
8	Central African Republic	700	26	1940	23	3	9	63	7	19	361	16	25
9	Chile	15,400	12	2860	15	-3	9	13	16	-4	16	-1	1
10	China	6,100	17	2940	14	3	9	61	10	7	49	4	16
11	Cuba	12,700	14	3190	11	3	9	11	18	-4	16	-7	49
12	Eritrea	700	26	1520	30	-4	16	74	5	21	441	25	62
13	Ethiopia	800	25	1860	27	-2	4	78	3	22	484	24	57
14	France	32,700	8	3640	8	0	0	2	24	-16	256	-16	25
15	India	2,900	18	2440	19	-1	1	55	12	6	36	7	49
16	Ireland	47,800	3	3690	5	-2	4	7	21	-18	324	-16	25
17	Israel	28,900	10	3680	6	4	16	2	24	-14	196	-18	32
18	Italy	31,000	9	3670	7	2	4	3	22	-13	169	-15	22
19	Japan	35,300	7	2770	16	-9	81	2	24	-17	289	-8	64
20	Liberia	500	29	1940	23	6	36	62	9	20	400	14	19
21	Luxembourg	85,100	1	3710	4	-3	9	1	29	18	324	25	62
22	Nepal	1,000	24	2450	18	6	36	92	1	23	529	17	28
23	North Korea (DPRK)	1,800	23	2160	20	6	36	23	15	-8	64	5	25
24	Peru	8,500	16	2570	17	-1	1	26	14	2	4	3	9
25	Portugal	22,000	11	3750	2	9	81	9	19	-7	49	-17	28
26	Sierra Leone	700	26	1930	25	1	1	57	11	15	225	14	19
27	Tajikistan	1,800	20	1840	28	-8	64	27	13	7	49	15	22
28	Tanzania	1,400	22	1960	22	0	0	76	4	18	324	18	32
29	United States	48,000	2	3770	1	1	1	2	24	-22	484	-23	52
30	Zambia	1,500	21	1930	25	-4	16	63	7	14	196	18	32
	SUM						426		452		7309		77

Correlation Analysis—Solutions

$$\text{Spearman's Rank Correlation} = 1 - \frac{6\,\Sigma d^2}{n(n^2-1)}$$

a. GDP and Caloric Intake

$$\text{Spearman's Rank} = 1 - \frac{6\,\Sigma d^2}{n(n^2-1)}$$

$$= 1 - \frac{6(426)}{30(30^2-1)}$$

$$= \frac{1 - 2556}{30(899)}$$

$$= 1 - 0.1$$

$$= .9$$

A very strong positive correlation exists between the two variables. That means that as GDP per capita increases it can be expected that caloric intake will also increase.

b. GDP and Workers in Agriculture

$$\text{Spearman's Rank} = 1 - \frac{6\,\Sigma d^2}{n(n^2-1)}$$

$$= 1 - \frac{6(7309)}{30(30^2-1)} = 1 - \frac{43854}{30(899)}$$

$$= 1 - 1.6$$

$$= .-0.6$$

A somewhat strong, negative correlation exists between the two variables. This means that as GDP per capita increases there a somewhat likely expectation that the number of workers employed in agriculture will decrease.

c. Caloric Intake and Workers in Agriculture

$$\text{Spearman's Rank} = 1 - \frac{6\,\Sigma d^2}{n(n^2-1)}$$

$$= 1 - \frac{6(7713)}{30(30^2-1)}$$

$$= 1 - \frac{46278}{30(899)}$$

$$= 1 - 1.72$$

$$= -0.72$$

A relatively strong, negative correlation exists between the two variables. This means that as Workers in Agriculture decreases, caloric intake increases.

Spearman Rank—Conclusions

1. Complete the following comparison:

	GDP and Caloric Intake	GDP and Workers engaged in Agriculture	Caloric Intake and Workers engaged in Agriculture
State the nature (type and strength) of the relationship between…			
Describe the relationship that exists between the two variables. (as 'x' increases, 'y'…)			

2. Suggest why these correlations exist?

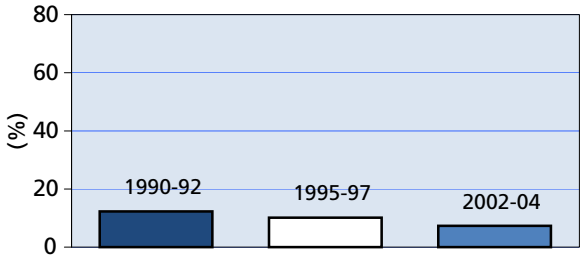
3. What are the consequences or implications of these correlations?

Food and Agriculture Organization Factsheet—Brazil

Monitoring progress towards hunger reduction goals of the World Food Summit (WFS) and the Millennium Declaration (MD)

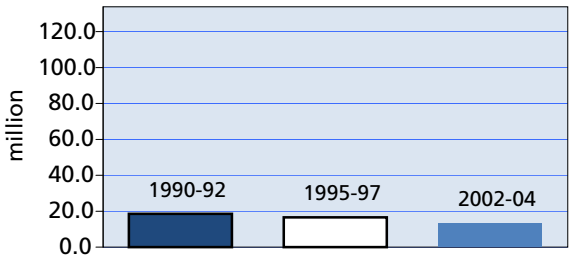
Brazil has a low level of undernourishment; 7 percent of the population is undernourished. Both the proportion and the number of undernourished people have decreased from 1990-92, benchmark period of the WFS and MD, to 2002-04, the latest period available.

Proportion of undernourished



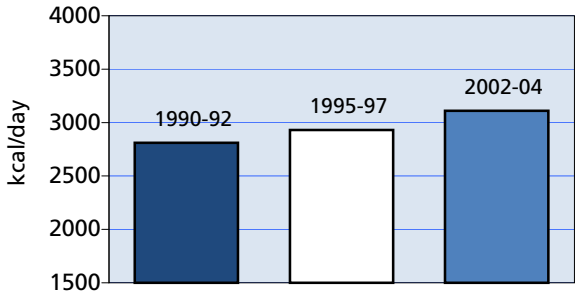
Food supply has improved since the beginning of the 90's.

Number of undernourished

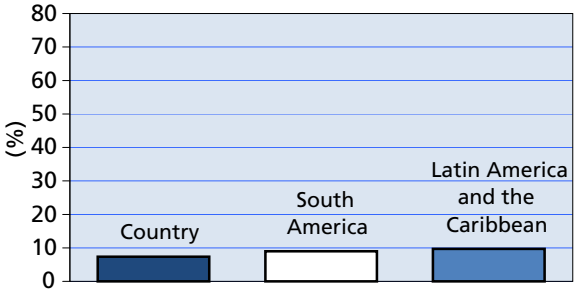


The prevalence of undernourishment in Brazil is lower than in South America and Latin America and the Caribbean.

Food supply per person



Proportion of undernourished, 2002-04



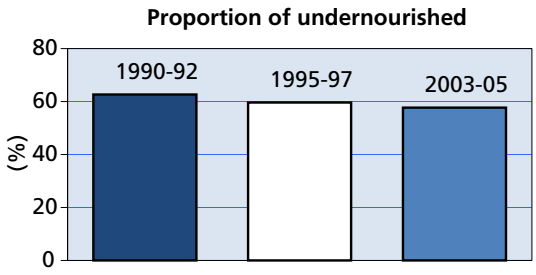
Selected statistics	1990-92	1995-97	2002-04
1. Population (million)	151.2	162.8	178.5
2. Food supply (kcal/person/day)	2810	2930	3110
3. Number of undernourished (million)	18.5	16.5	13.1
4. Proportion of undernourishment (%)			
Brazil	12	10	7
South America	14	10	9
Latin America and the Caribbean	13	11	10

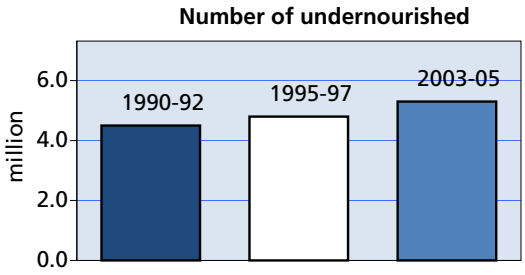
Last Update: 03/09/2006

Food and Agriculture Organization Factsheet—Haiti

Monitoring progress towards hunger reduction goals of the World Food Summit (WFS) and the Millennium Declaration (MD)

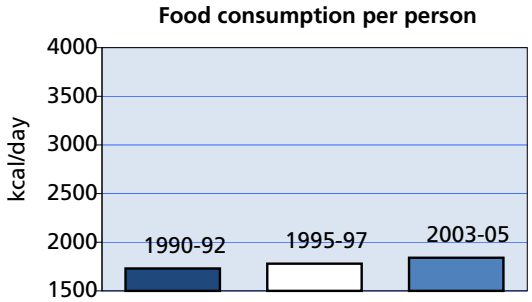
Haiti had a very high level of undernourishment in 2003-05, the latest period available; 58 percent of the total population was undernourished. The number of undernourished increased from 1990-92, benchmark period of the WFS and MDG, to 2003-05 while the proportion of undernourished decreased from 1990-92 to 2003-05.

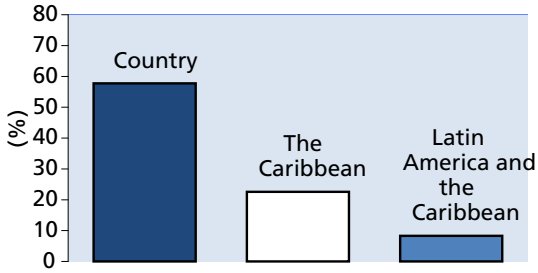




Food consumption has increased since the beginning of the 90's.

The prevalence of undernourishment in Haiti was higher than in The Caribbean and Latin America and the Caribbean.





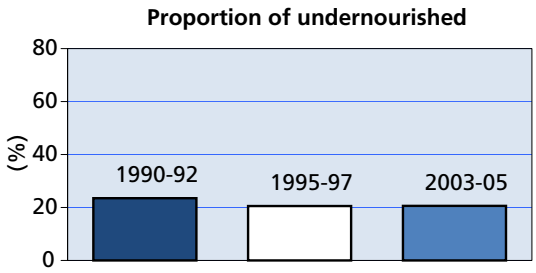
Selected statistics	1990-92	1995-97	2003-05
1. Population (million)	7.3	8.0	9.2
2. Food consumption (kcal/person/day)	1730	1780	1840
3. Number of undernourished (million) - WFS indicator	4.5	4.8	5.3
4. Prevalence of undernourishment (%) - MDG indicator			
Haiti	63	60	58
The Caribbean	26	28	23
Latin America and the Caribbean	12	11	8

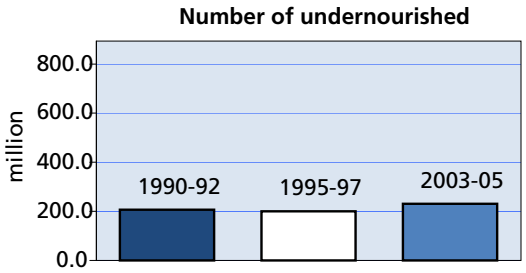
Last Update: 07/08/2008

Food and Agriculture Organization Factsheet—India

Monitoring progress towards hunger reduction goals of the World Food Summit (WFS) and the Millennium Declaration (MD)

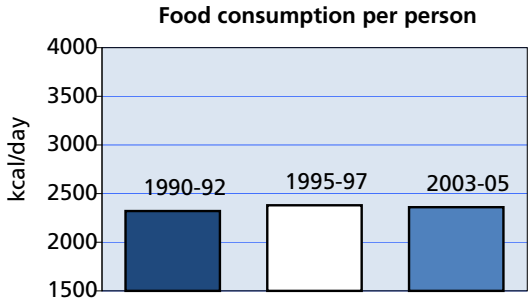
India had a high level of undernourishment in 2003-05, the latest period available; 21 percent of the total population was undernourished. The number of undernourished decreased from 1990-92, benchmark period of the WFS and MDG, to 1995-97 but increased from 1995-97 to 2003-05 while the proportion of undernourished decreased from 1990-92 to 1995-97.

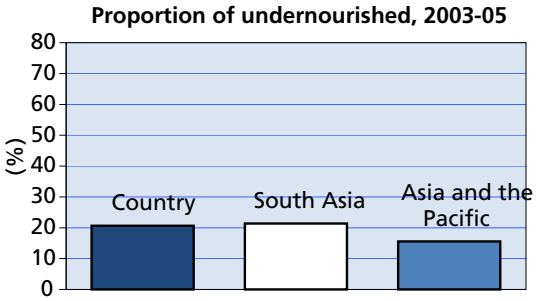




Food consumption decreased in 2003-05.

The prevalence of undernourishment in India was similar to that in South Asia but higher than in Asia and the Pacific.





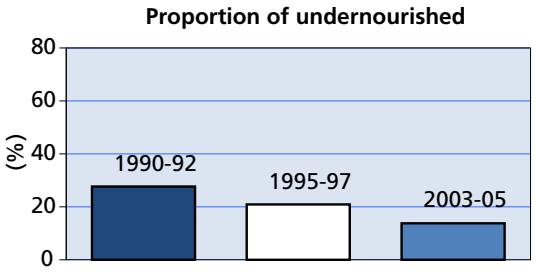
Selected statistics	1990-92	1995-97	2003-05
1. Population (million)	878.9	972.9	1117.0
2. Food consumption (kcal/person/day)	2320	2380	2360
3. Number of undernourished (million) - WFS indicator	206.6	199.9	230.5
4. Prevalence of undernourishment (%) - MDG indicator			
India	24	21	21
South Asia	25	22	21
Asia and the Pacific	20	17	16

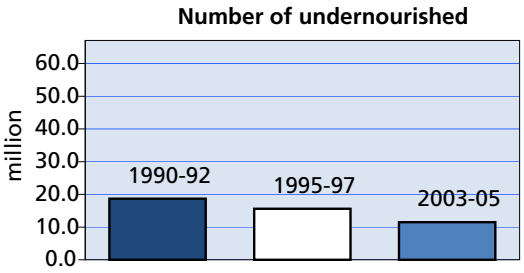
Last Update: 07/08/2008

Food and Agriculture Organization Factsheet—Vietnam

Monitoring progress towards hunger reduction goals of the World Food Summit (WFS) and the Millennium Development Goals (MDG)

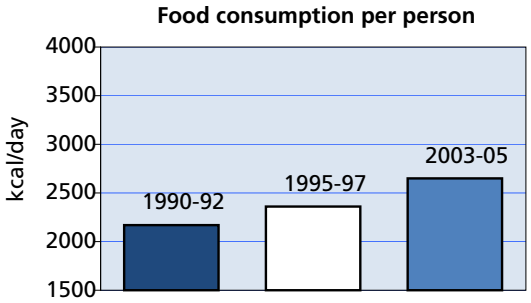
Vietnam had a moderate level of undernourishment in 2003-05, the latest period available; 14 percent of the total population was undernourished. Both the number and proportion of undernourished decreased from 1990-92, benchmark period of the WFS and MDG, to 2003-05.

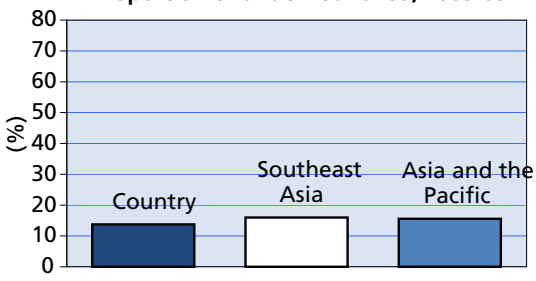




Food consumption has increased since the beginning of the 90's.

The prevalence of undernourishment in Viet Nam was lower than in Southeast Asia and Asia and the Pacific.





Selected statistics	1990-92	1995-97	2003-05
1. Population (million)	67.6	74.5	83.8
2. Food consumption (kcal/person/day)	2170	2360	2650
3. Number of undernourished (million) - WFS indicator18.715.611.5			
4. Prevalence of undernourishment (%) - MDG indicator			
Vietnam	28	21	14
Southeast Asia	24	18	16
Asia and the Pacific	20	17	16

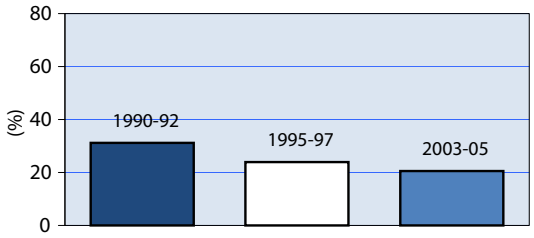
Last Update: 07/08/2008

Food and Agriculture Organization Factsheet—Sudan

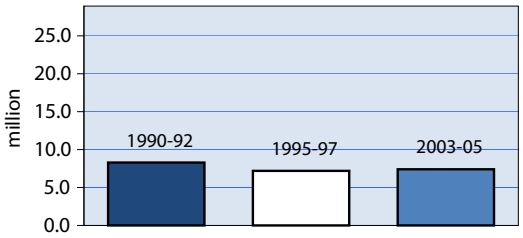
Monitoring progress towards hunger reduction goals of the World Food Summit (WFS) and the Millennium Development Goals (MDG)

The Sudan had a high level of undernourishment in 2003-05, the latest period available; 21 percent of the total population was undernourished. The number of undernourished decreased from 1990-92, benchmark period of the WFS and MDG, to 1995-97 but increased from 1995-97 to 2003-05 while the proportion of undernourished decreased from 1990-92 to 2003-05.

Proportion of undernourished



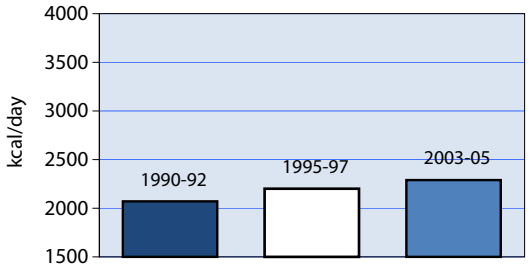
Number of undernourished



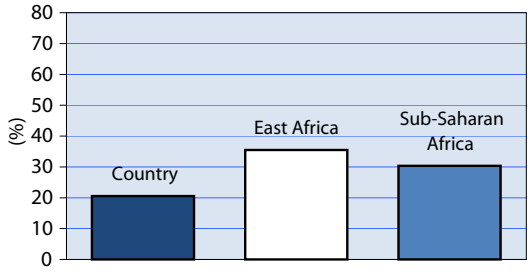
Food consumption has increased since the beginning of the 90's.

The prevalence of undernourishment in The Sudan was lower than in East Africa and Sub-Saharan Africa.

Food consumption per person



Proportion of undernourished, 2003-05



Selected statistics	**1990-92**	**1995-97**	**2003-05**
1. Population (million)	26.6	30.3	36.2
2. Food consumption (kcal/person/day)	2070	2200	2290
3. Number of undernourished (million)—WFS indicator	8.3	7.2	7.4
4. Prevalence of undernourishment (%)—MDG indicator			
Sudan	31	24	21
East Africa	45	44	35
Sub-Saharan Africa	34	34	30

Last Update: 07/08/2008

Estimated Time

Introduction + 6 lessons

Overall Expectations

By the end of these activities, students will be able to:

- interpret statistics to determine trends in farming in Canada
- define what is meant by 'local' and state its significance
- identify foods that are produced locally
- identify factors that influence small scale farming
- compare 3 different options to family farming in Ontario
- promote awareness and understanding of types of small scale farming practices

Enduring Understandings

- Students will understand the basic trends in farm sizes, number of farmers and revenues and identify how this impacts our food supply.
- Students will be able to show an understanding of the role and importance of local, small scale food production.

Getting Ready

1. Prepare BLMs for each lesson, as needed
   - BLM 3D-1 Commonly Used Agricultural Terms
   - BLM 3D-2 Trends in Agriculture in Canada with Statistics and Questions
   - BLM 3D-3 Trends in Agriculture—Solutions
   - BLM 3D-4 Eat Local Food Challenge
   - BLM 3D-5 Why Eat Locally
   - BLM 3D-6A to 6C Comparison of 3 Local Farm Operations
   - BLM 3D-7 Comparison of 3 Local Farm Operations—VENN Diagram
   - BLM 3D-8 Local Farm Operations—Advantages and Disadvantages of Farm Type
   - BLM 3D-9 Creating Awareness—The Challenge of Finding Locally Grown Food
2. Book access to a computer lab for research purposes as needed.
3. Preview the Common Threads DVD with particular emphasis on food production.
4. Poll the students to determine where they make their food purchases.

Teaching & Learning Strategies

Lesson 1 Terminology—15–20 minutes at the start of local lessons) Students should complete the BLM 3D-1 on Terminology in Agriculture as a diagnostic assessment of their knowledge of terms and concepts related to agriculture. Advise students that these are terms that they will need to be familiar with in order to work effectively through the lessons that follow.

Answers:
1—C; 2—B; 3—G; 4—H; 5—A; 6—I; 7—D; 8—F; 9—E; 10—J

Lesson 2 Basic Trends in Agriculture in Canada
This lesson provides the students with the opportunity to identify trends in Canadian agriculture. They are asked to look at the statistics, BLM 3D-2, answer questions on what trends are shown, and make some predictions about why these trends have occurred. In addition they are asked to extend their understanding of the trends to a country which is just starting to experience improved technology and urbanization.

Alternatively, this could be used for a lesson in graphing/working with statistics. Students could produce line graphs from the first table, BLM 3D-2. Compound bar graphs or circle graphs could be used for the second table. Once students complete the graphing exercise, they could then answer the questions provided on BLM 3D-3. An answer sheet is provided for BLM 3D-3.

Lesson 3 Eat Local Food Challenge
Use this as a diagnostic tool to assess student knowledge of local food production and access.

Have the students complete the scavenger hunt, BLM 3D-4, finding the answers using the local phone book, local paper, Internet, and by talking to people at home and in their community.

Students should share their answers with the class and start to gain an appreciation for what food is produced and accessible locally. Answers are not provided as they will vary by region in Ontario.

Lesson 4 Why Eat Locally?
Provide students with BLM 3D-5, Why Eat Locally? Review each of the reasons provided, asking them why that point would be included on this list.

Students are asked to place each reason in a category—social, environmental, economical or political—to show their understanding of the importance and significance of the reasons provided.

Once the students have an understanding of the points' significance, they should rank the reasons in order of importance (from 'most important' to 'least important') that would best convince them to purchase local food. They should complete their own ranking, then share what they consider to be the most convincing factors, with a partner.

As a full class, use an inside/outside circle (half the class forms the inner circle facing outwards, the other half forms the outer circle facing inwards) and have the inner students briefly explain their reasoning to the person they face on the outer circle. Move the outer circle several students, then have the outer circle explain their ideas. Continue this movement several times, alternating answers back and forth between the two circles.

Literacy component: Review how to write an opinion paragraph: structure, mechanics, etc. Have

the students write a response to a question, such as, "Should we eat more local food?"

Lesson 5 A Comparison of Three Small-Scale Local Farm Operations
Form students into 3 groups. These will be the expert groups. Provide each expert group with one of the three farm scenarios, BLM 3D-6A to 6C. The group needs to familiarize itself with its scenario and be prepared to take on the role of that particular farmer.

Students will get together into home groups of 3 (jigsaw process) with one of each local farmer represented. Each needs to describe his/her farming operation to the group.

Then, as a home group, generate a VENN diagram, BLM 3D-7, to identify what the farms have in common and how they are different. Discuss the ideas generated with the entire class.

Next, in your expert group, discuss the advantages and disadvantages of each method of farming, creating a T chart, BLM 3D-8, of ideas for each of the three farm types. Share ideas with the class.

Establish an area in the room for each of the 3 types of farms. Have students decide which of the 3 farms they would choose to support. They should move to the area represented by this farm. At each location, students should pair up and discuss the reasons for their choice.

Randomly select students from each of the 3 "farm" locations, and have them identify the reasons why people moved to that particular farm type.

Lesson 6/7 (2 classes) Creating Awareness of a Locally Grown Food—Using BLM 3D-9, ask students to choose 3 tasks to complete—one each from the breakfast, lunch, and dinner columns.

Commonly Used Agricultural Terms

	Match	Term	Letter	Definition
1		100 mile diet	A	refers to the industrialized production of meats, fruits and vegetables (large scale, technology and energy intensive, large quantities produced)
2		Agri-business	B	large scale business farming; may be involved in the growing, processing and distribution of products (vertically integrated)
3		Community Supported Agriculture (CSA)	C	eating of food that has been grown or produced within a distance of 100 miles
4		Family farm	D	when only one type of crop is grown on the land, often year after year
5		Corporate/Industrial farming	E	an indigenous form of agriculture; based on ecological and social systems of the region
6		Locavore	F	foods grown without the use of synthetic fertilizers, pesticides, herbicides, hormones, etc
7		Monocropping	G	is a system of farming that directly connects the producer to the consumer; consumer may also assist with the growing or harvesting of the produce
8		Organic	H	Farm is owned and operated by a family, often passed down from one generation to the next
9		Traditional Farming	I	the name given to a person who attempts to eat only local food with a goal to supporting more sustainable farming and consumption practices
10		Farm Gate Operation	J	Produce is sold at the farm or roadside.

Trends in Agriculture—Statistics

Selected Agricultural Trends in Canada 1901–2006

Year	Number of Farms	Number of Farmers	Size of Farm (ha)
1901	511 000	718 000	50
1911	683 000	928 000	65
1921	711 000	1 025 000	80
1931	729 000	1 118 000	91
1941	733 000	1 074 000	96
1951	623 000	826 000	113
1961	481 000	649 000	145
1971	366 000	510 000	188
1981	318 000	508 000	207
1991	280 000	533 000	242
2001	246 923	346 200	274
2006	229 373	327 155	295

Sources:
Clark, B, Wallace, J (1999). Making Connections—Canada's Geography. Scarborough, Ontario: Prentice Hall Ginn Canada.
Statistics Canada, 2008

Number of Canadian farms by revenue class (2005 dollars), 1996–2006

	Farms		Percentage Change
Revenue class (Dollars)	1996	2006	1996 to 2006
10,000 to 99,999	128.590	100,284	-22.0
100,000 to 249,000	50,733	39,971	-21.2
250,000 to 499,999	17,977	22,837	27.0
500,000 to 999,999	5,904	10,241	73.5
1,000,000 to 2,499,999	2,174	4,259	95.9
2,500,000 and over	676	1,643	143.0
Total	**206,054**	**179,235**	**-13.0**
Does not include farms with revenues under $10,000			

Source: Statistics Canada, "Are Canada's Largest Farms Really Different?", 2008

Trends in Agriculture—Questions

1. What is the trend in each of the following:
   a) number of farms?
   b) number of farmers?
   c) farm size?
   d) farm revenues?

2. What has allowed or caused these trends to occur?

3. Generally, how has agriculture in Canada changed because of these trends?

4. What are some issues that exist because of these changes in agriculture?
   (think socially, economically, environmentally, and politically [SEEP]).

5. In regards to these changes in agriculture and their impact on Canadians, what recommendations would you make to a developing country that is just starting to see its population become significantly more urban and technology be more widely accepted?

Trends in Agriculture—Solutions

1. What is the trend in each of the following:
   a) Number of farms is decreasing.
   b) Number of farmers is decreasing.
   c) Farm size is increasing.
   d) Total farm revenues have decreased.
   The number of farms with revenues over $250 000 has decreased while the greatest increase in number of farms has occurred with those that have revenues over $2 500 000.

2. What has allowed or caused these trends to occur? (answers might include)

- increased and improved technology means that fewer farmers and farms are needed to produce the same amount, or more, food
- average age of farmers is increasing and fewer young people are able to or interested in farming
- increased urban pressure means that near-urban farms are lost to development
- the price received for food has not risen as quickly as the cost of producing the food so that revenues and profits are reduced
- increased competition from other global locations for the production of low cost food means Canadian farmers can't compete
- Canada has become more culturally diverse, and more global and as a result, the population demands culturally accepted foods grown elsewhere

3. Generally, how has agriculture in Canada changed because of these trends?

- It has become more industrialized due to costs and competition

4. What are some issues that exist because of these changes in agriculture (think socially, economically, environmentally, and politically [SEEP]. Answers might include:

- reliance on imported food stuff
- reliance on only a few corporations to produce the majority of our food
- food safety issue
- loss of land to urban development, land that can never be recovered for agricultural us
- increased consumption of processed food

5. In regards to these changes in agriculture and their impact on Canadians, what recommendations would you make to a developing country that is just starting to see its population become significantly more urban and technology be more widely accepted.

- Answers will vary: protect own farm land; avoid large scale development; provide nutritious food, etc.

Eat Local Food Challenge

Use the Internet and other sources provided by your teacher to answer the following questions.

1. Find the name of one restaurant in your area that makes a habit of serving locally produced food.

2. Name the location of a farmer's market that you can purchase locally produced food at.

3. The name of an organic farm in your area.

4. A local Community Supported Agriculture (CSA) farm.

5. Two types of vegetable that are grown locally.

6. Two types of fruit that are grown locally.

7. A supermarket that has a 'local' food section.

8. A supermarket that has an 'organic' food section.

9. The name of a local 'pick your own' farm (or farm gate operation) OR a community garden.

10. An organization that helps with the promotion of local food in your area.

11. A local spring product and a local fall product.

Why eat locally?

Look at the list of reasons in support of buying locally produced food.

A. Categorize these by SEEP (Social, Economic, Environmental, and Political).
Which categories appear to be the most supportive of eating local food?

B. Rank, in order from most to least important, the reasons that would convince you to buy locally.
Compare your ranking with a peer. How similar or different are your ideas?
Select your top 5 reasons for eating locally grown food.

C. Complete a class discussion on what the most important reasons are for eating food grown locally.

D. Write an opinion paragraph on the significance of eating locally grown food.

Reason for Eating Locally	SEEP	Your Ranking
Preserves family farms.		
Preserves rural heritage.		
Money goes directly to the farmer.		
Provides local jobs.		
Locally grown food is fresher/often picked within the last 24 hours.		
More variety in produce compared to supermarkets.		
Produce is unique to an area due to soil and climate conditions.		
Lower transportation costs.		
Produce has optimum nutrients as it is picked ripe.		
Consumers get to know the farmer and products.		
Decreases your ecological footprint.		
Fewer CO2 and other greenhouse emissions with less transportation involved.		
Uses less fuel for transport.		
Active participation occurs in producing crops, visiting farms or markets.		

Comparison of 3 local farm operations—Farm A

Community Supported Agriculture (CSA)	• farm was established in 1979 • 6th generation of family to 'steward' the land • organic since 1989	• grow food for a predetermined group of consumers who pay an annual fee to purchase their share of the harvest • support 160 families regular share is $500, working share is $465 per season
• 80 acres • organic operation • 2 owner-operators and • 3 seasonal apprentices	• vegetables and fruits from early spring to late fall	believe: • they are 'claiming' back a connection to the production of their food' • farmers are supported locally and people eat food grown in their own area • get back to touch with where food comes from • receive fresh, organically grown produce
• about 30 km from a major city	• horse driven; no tractors • organic produce	• families pick up their share weekly from the farm during the summer season

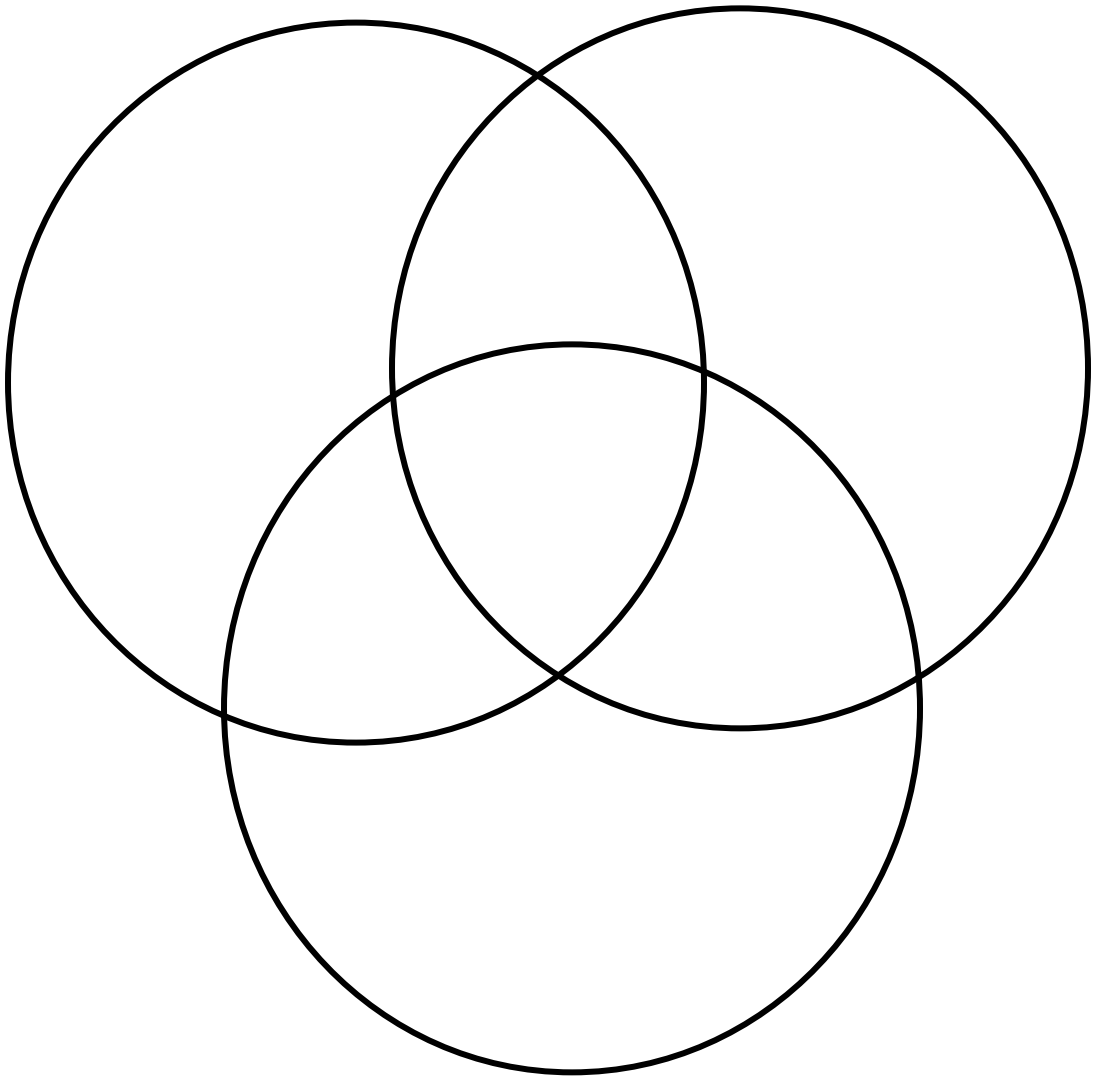
Comparison of 3 local farm operations—Farm B

Family Mixed Farm + Market Garden	• family farm for over 100 years	• ' pick your own' operation • farm market store on site • attend Saturday Markets in 3 small communities; extended season at these markets with vegetables kept in cold storage until needed
• 100 acres • owner operated • 2 full-time and 3 part time + seasonal workers for harvesting some fruits	• mixed farm • fruits and vegetables (asparagus, strawberries, seasonal summer fruits and vegetables)	Experiences at farm include: • pick your own • farm visits • activities for children • educational programs
• practice stewardship of the land but are not organic	Challenges include • attending off site markets • finding reliable seasonal workers • environmental challenges	

Comparison of 3 local farm operations—Farm C

Organic Green House Operation	• family farm • established in 1987 • full transition to organic in 2004	• produce is available all year round
• 2 owner—operators • 6-10 part time local workers • employed year-round • 90 acres	• lettuces, salad greens, mini and micro seedlings and sprouts are grown in several greenhouses • product is readily perishable so must move product to market fairly quickly	• farm gate sales on weekends (include organic products from other local farmers) • use a distributor to move produce to small market stores and restaurants • market is in larger cities in S. Ontario with limited sales in the USA
• 30 km from a major city • on a major highway; a half hour drive to the USA border	• former tobacco farm • working to move land to organic production (hay and cash crops)	• use environmentally friendly packaging • use ground water as water supply • newer greenhouses means more energy efficient ones

Comparison of 3 local farm operations—VENN Diagram



Local Farm Operations—Advantages and Disadvantages of Farm Type

Farm	Advantages	Disadvantages
Farm A **CSA**		
Farm B **Family Farm**		
Farm C **Greenhouse**		

Creating Awareness—The Challenge of Finding Locally Grown Food

This activity provides you with an opportunity to reflect on the issues concerning buying locally produced food and addresses one of the greatest challenges that local producers appear to face—educating the local population about the food resources that are available in their local neighborhoods.

You are to choose 3 tasks to complete—one for breakfast, one for lunch and one for dinner. The idea is to generate some creative ideas on how to advertise local food products and to offer a personal opinion on current food practices.

Breakfast	Lunch	Dinner
Create a slogan for a local farm/produce	Write a letter to your local MP or MPP advocating for support of local agriculture.	Write, and present a short skit or Tableau about local food production.
Create a 30 second jingle for a local farm/produce	Write an editorial to you local newspaper about the significance of eating locally.	Create a piece of artwork or poster advertising local food production.
Create a logo for a local farm/produce	Write a letter to your local school board advocating for the use of locally grown food in your cafeteria.	Write, and perform a song about producing food locally.

Estimated Time Required
1 1/2 classes (100 minutes)

Overall Expectations
Students will gain an understanding on the cost of basic food needs for a family, and the need for food support programs for low income individuals and families.

Enduring Understandings
- A minimum wage income is often insufficient to support a family
- Food banks begun as temporary measures to fight food shortages have become community fixtures.
- Food bank users share common characteristics, including immigrant households, families with disabled breadwinners, families headed by single women.

Prior learning
None required

Getting Ready
For background information on food security in Ontario, access the Healthy Communities in Ontario website: *http://www.healthycommunities.on.ca/publications/healthy_food*

For information on food bank usage in the province:
Ontario Association of Food Banks: *http://www.oafb.ca/portal/index.*

1. Book a computer lab or locate and duplicate information on food bank usage.
2. Duplicate Nutritious Food Basket worksheets from health unit in your area These can be accessed through your Public Health Unit, BLM 3E-1A to E. Each health unit calculates and publishes local food costs annually Some Units make the worksheets available online, while others publish the Cost of the Nutritious Food Basket only Food costing information for the communities of Ottawa, BLM 3E-1A; Thunder Bay, BLM 3E-1B; Durham Region, BLM 3E-1C; and Toronto, BLM 3E-1D; have been included as black line masters.

Teaching and Learning Strategies

This activity will work well using a carousel format Students can move in small groups from one activity centre to the next until all material has been covered.

Activity Centre 1 (25 minutes)
Each student completes the Nutritious Food Basket costing for his/her family. Use the appropriate regional BLM from the "Getting Ready" section above.

Activity Centre 2 Ontario Hunger Report, 2008 (25 minutes)
http://www.oafb.ca/assets/pdfs/HungerReport2008.pdf
Students access data information from Statistics Canada (www.statcan.ca) and the Ontario Hunger Report. Students can map centers experiencing greatest food bank usage, and link median incomes for each census area with food bank usage.

To enrich this activity, or link it to current economic events, students can access news reports to link issues of regional economic development to food bank usage in 2008. Based on current business and economic events, etc. students can create a forecast for current and future food bank usage.

Activity Centre 3 (25 minutes): Profile of a Food Bank Patron
Students complete a profile of a typical food bank user in Ontario by collating data from Ontario Association of Food Banks http://www.oafb.ca/assets/pdfs/HungerReport2008.pdf, (pages 7-9); see Who's Hungry 2008 available from the Daily Bread Food Bank, or http://www.hungrycity.ca for a profile of a Toronto area food bank patron.

After all activities have been completed, a class discussion on the incidence of food insecurity in Ontario should follow to consolidate the student's learning. A visit to the local food bank, or a speaker from the local food bank would also serve to support the learning in this activity. Does the existence of food banks in Ontario ensure that low income families and individuals have access to a nutritious diet?

Extension Activity: Students can conduct further research and engage in a class debate on the question: Food Banks should/should not be a fixture in our communities.

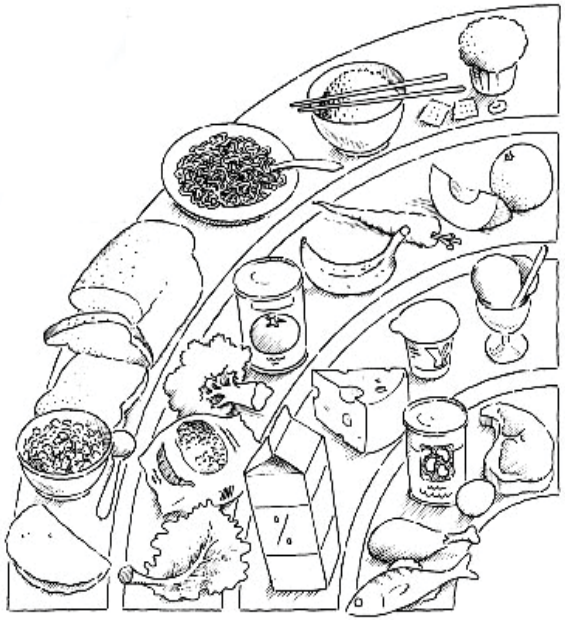
Nutritious Food Basket—Ottawa

The Cost of a Nutritious Food Basket in Ottawa for 2007

The Ontario Nutritious Food Basket

In May 2007, the cost of a nutritious food basket was priced for Ottawa according to the Ontario Nutritious Food Basket (ONFB) guidelines.

- The Ontario Nutritious Food Basket is an economical estimate of food costs for a balanced diet for people in various age and gender groups.
- The Food Basket is calculated from the costing of a variety of commonly used, widely available foods from the four food groups of *Canada's Food Guide to Healthy Eating.*
- Food staples such as flour, spreads, oils and sugar are included as well as costs for spices, seasonings and beverages.



How this information can be used

- To estimate economical food costs to meet *Canada's Food Guide to Healthy Eating* guidelines for individuals or a group.
- To develop case studies for budgeting or home management programs.
- To help advocate for financial security to ensure a nutritious diet for those at lower income levels.

The ONFB is an underestimation of the needs of people who need a special medical diet. Their food costs and nutritional needs are higher.

The cost of feeding babies under one year of age is not included the ONFB and would be an additional food cost for households.

The costs for meals purchased away from home would also need to be added to the basic Food Basket for households.

The Nutritious Food Basket Cost for a Family of 4

The ONFB has a reference family of four:

35 year old man;
34 year old woman;
teenage boy, age 13;
girl, age 8

The monthly Nutritious Food Basket for this Ottawa family would cost:

$573.00

www.ottawa.ca
July 2007

Nutritious Food Basket—Ottawa

How to Find the Cost of a Nutritious Food Basket for Your Household or Group

1. **List the ages and sex of all the people in your household or group.**

   For example, the Jones family:
   Man, 35 years old
   Woman, 34 years old
   Boy, 13 years old
   Girl, 8 years old

2. **Find the Food Basket cost for each person in Table 1. Add up those costs.**

   For example, for the Jones family:

Man, 35 years old	$177.00
Woman, 34 years old	$127.00
Boy, 13 years old	$163.00
Girl, 8 years old	$106.00
Total Food Basket Cost	$573.00

3. **Make adjustments to the Food Basket cost for households of less than four.**

Because of the package size of usual food purchases, food costs are higher for smaller groups of people.

- **For a 1 person household:**
  add 15% more to the food costs in Table 1 (multiply food cost by 1.15)
  For example: A 27 year old man
  Food cost =$177.00 x 1.15 = **$203.55**

- **For a 2 person household:**
  add 10% more to the food costs (multiply food cost in Table 1 by 1.10)

- **For a 3 person household:**
  add 5% more to the ONFB cost (multiply food cost in Table 1 by 1.05)

☎ To obtain the **Technical Report for the Ottawa Nutritious Food Basket**, please contact Ottawa Public Health at (613) 580-6744 ext. 23740 OR healthsante@ottawa.ca

Detailed Monthly Nutritious Basket Costs in Ottawa for 2007

Family of four $573.00

Sex/Group	Age	Cost/Month
Child	1	$66.00
	2 - 3	$70.00
	4 - 6	$92.00
Boy	7 - 9	$110.00
	10 - 12	$136.00
	13 - 15	$163.00
	16 - 18	$192.00
Girl	7 - 9	$106.00
	10 - 12	$127.00
	13 - 15	$135.00
	16 - 18	$130.00
Man	19 - 24	$182.00
	25 - 49	$177.00
	50 - 74	$160.00
	75+	$145.00
Woman	19 - 24	$133.00
	25 - 49	$127.00
	50 - 74	$125.00
	75+	$122.00

Pregnancy	**19-24 yr**	**25-49 yr**
1st trimester	$ 147.00 -	$140.00
Trimester 2 & 3	$ 156.00-	$149.00

Breastfeeding	**19-24 yr**	**25-49 yr**
	$ 160.00	$152.00

Nutritious Food Basket—Thunder Bay

Budgeting for Food 2008

Eating a nutritious diet is important to help ensure optimal growth and development and to help prevent some chronic diseases. The Health Unit conducts a food cost survey every year in local grocery stores to calculate the cost of eating well in the District of Thunder Bay. These costs are based on a healthy diet including a variety of foods from Canada's Food Guide. Often the money available for food is used to pay for other household expenses. So, you need to make sure to budget money just for food.

How can this information be used?

- To estimate what it might cost to feed individuals, a family or a group of people (like in group homes, shelters, students sharing a house) and compare it to incomes.
- To make up case studies for discussion in budgeting or education programs.
- To discuss the difficulty those with a limited income may have with being able to afford a nutritious diet.

Weekly Costs of Eating Well in the District of Thunder Bay*

	Age	Cost
Child	1 year	$18.10
	2-3 years	19.58
	4-6 years	26.21
Boy	7-9 years	31.63
	10-12 years	38.72
	13-15 years	44.90
	16-18 years	52.32
Girl	7-9 years	29.86
	10-12 years	35.27
	13-15 years	37.84
	16-18 years	35.94
Man	19-24 years	49.48
	25-49 years	47.58
	50-74 years	42.78
	75+ years	38.71
Woman	19-24 years	36.63
	25-49 years	34.66
	50-74 years	33.86
	75+ years	32.88

Weekly Costs of Eating Well in the District of Thunder Bay During Pregnancy and Breastfeeding*

Age	Stage of Pregnancy or Breastfeeding	Cost
13-15 years:	1st Trimester	$41.10
	2nd Trimester	43.37
	3rd Trimester	43.37
	Breastfeeding	44.98
16-18 years:	1st Trimester	40.85
	2nd Trimester	43.99
	3rd Trimester	43.99
	Breastfeeding	45.36
19-24 years:	1st Trimester	39.98
	2nd Trimester	42.86
	3rd Trimester	42.86
	Breastfeeding	45.09
25-49 years:	1st Trimester	38.19
	2nd Trimester	40.61
	3rd Trimester	40.61
	Breastfeeding	41.61

*Based on average prices from 6 stores during June, 2008.

Nutritious Food Basket—Thunder Bay

Estimate Your Food Costs

Sample Household Food Cost Sheet		
Person	Age	Cost
Man	41	$47.58
Woman	39	34.66
Boy	14	44.90
Subtotal = $127.14		
$127.14 x 1.05 = **$133.50** Subtotal x adjustment = **cost per week** $133.50 x 4.33 = **$578.04** cost per week x 4.33 = **cost per month**		

Sample Household Food Cost Sheet		
Person	Age	Cost
Subtotal =		
_____ x _____ = _____ Subtotal x adjustment = **cost per week** _____ x _____=_____ cost per week x 4.33 = **cost per month**		

1. Write down the sex and age for each person in your household.
2. Write down the weekly food cost for each person according to the tables on the other page.
3. Add up the food costs for your household to get a subtotal.
4. Since it costs more per person to feed a small group than to feed a larger group of people, you should adjust the subtotal according to the adjustment factor in the box to the right. Multiply the subtotal by the adjustment factor that is right for your household.
5. The weekly cost can be changed to a monthly cost by multiplying the total by 4.33.

Adjustment Factor

If you are feeding:
1 person – multiply by 1.15
2 people – multiply by 1.10
3 people – multiply by 1.05
4 people – multiply by 1
5 people – multiply by 0.95
6 people – multiply by 0.90

Caution

- These calculations are a *guideline* for what you could be spending on food in order to stay healthy. It does not guarantee that you will be healthy by spending this amount. Eating a balanced diet based on Canada's Food Guide is the key to good nutrition.
- The food budget estimate does not include money for convenience foods, snack foods, eating out or for paper, personal hygiene and cleaning products. You need to budget extra money for these items.

Distributed by the Thunder Bay District Health Unit, 2008.

Nutritious Food Basket—Durham Region

The Cost of a Nutritious Food Basket in Durham Region for 2007-2008

In June, 2007, Durham Region Health Department priced the cost of a Nutritious Food Basket during a two week period. The costing reflects the average price that would be paid by shoppers who went to 12 different grocery stores throughout Durham Region.

The Ontario Nutritious Food Basket is a food costing tool that is used to measure the cost of healthy eating based on current nutrition recommendations. It is a listing of 66 foods which are priced to estimate the average cost of feeding individuals and families. The Nutritious Food Basket includes only basic food items and does not include foods from restaurants, packaged convenience foods, snack foods, frozen pre-cooked foods, soups, sauces and items for food preparation such as flavourings, spices, etc. Items are priced at the lowest cost available, regardless of brand name. The importance of items such as coffee, tea, condiments, sauces and spices is accounted for by a 5% factor added to the total cost of the basket. The figures are updated annually.

How to use Nutritious Food Basket Information

Food cost information can be used in a variety of ways to:

- Determine the cost of healthy eating for individuals or households.
- Estimate the cost of feeding a group of people (group homes, shelters, students, etc,) Make up case studies for discussion in education programs
- Compare the cost of healthy eating against income and other fixed living expenses.

Highlights from Durham Region:

(more detailed survey results can be found on the back of this sheet)

Weekly Food Costs:

• Family of 4 (man & woman, 25 - 49 yrs, boy 13 yrs, girl 7 yrs):	$137.93
• Family of 6 (man & woman, 25-49 yrs, 3 boys 17, 12, 10 yrs, girl 15 yrs):	$218.60
• Mother 24 yrs + 4 yr old girl + 6 yr old boy:	$ 77.74
• Father 50 yrs + 14 yr old boy:	$ 77.22
• Single woman 22 yrs:	$ 33.22
• Single man 75 yrs:	$ 34.44

Call Durham Health Connection Line @ 905 666 6241 or 1800 841 2729 or visit www.region.durham.on.ca

Nutritious Food Basket—Durham Region

The Weekly Cost of the Nutritious Food Basket in Durham Region

Sex	Age	Cost per week ($)
Child	1	16.43
	2-3	17.27
	4-6	22.76
Boy	7-9	27.11
	10-12	33.69
	13-15	39.34
	16-18	45.45
Girl	7-9	26.12
	10-12	31.18
	13-15	33.29
	16-18	31.52

Sex	Age	Cost per week ($)
Man	19-24	42.97
	25-49	41.71
	50-74	37.88
	75+	34.44
Woman	19-24	32.22
	25-49	30.77
	50-74	30.24
	75+	29.45
Pregnant Woman	1st Trimester	36.85
	2nd & 3rd Trimester	38.87
Breastfeeding Woman		39.93

To estimate the weekly cost of a nutritious food basket for your household, follow these steps. An example is provided:

Example		
Sex	**Age**	**Cost**
Man	42	*41.71*
Woman	39	*30.77*
Boy	14	*39.34*
Boy	17	*45.45*
Girl	8	*26.12*
Subtotal = *180.68*		
x 0.95 = adjustment		*183.39*
		TOTAL

TOTAL

Step 1: Write down the sex and age of each person you are Feeding.

Step 2: Using the chart above, write down the weekly food cost for each person.

Step 3: Add the weekly food costs together. This is your **subtotal.**

Step 4: It costs a little more to feed a small group and less to feed a larger group. Use the following adjustments for group size:

1 person – multiply by 1.15

2 people – multiply by 1.10

3 people – multiply by 1.05

4 people – make no change

5 people – multiply by 0.95

6 people – multiply by 0.90

Your Household		
Sex	**Age**	**Cost**
Subtotal =		
x 0.95 = adjustment		

Nutritious Food Basket—Toronto

The Cost of a Nutritious Food Basket in Toronto for 2008

The Nutritious Food Basket (NFB) is Ontario's standardized food costing tool that measures the basic cost of healthy eating in each Board of Health jurisdiction. Toronto Public Health is required to annually conduct the NFB costing survey using a guideline prepared by the Ministry of Health and Long Term Care, Monitoring the Cost of a Nutritious Food Basket Protocol. This protocol requires that 66 specified foods be priced in at least six different grocery stores. The NFB includes basic food items from all food groups in Canada's Food Guide. The foods included in the survey are based on nutrition recommendations and Canadian purchasing patterns. During the costing, the lowest available price is recorded for each food item in each of the grocery stores. It is important to note:

- The NFB does not include processed and prepared foods, snack foods and restaurant or take-out foods. It excludes essential non-food items such as laundry detergent, soap and other personal care products.
- It assumes most people have the necessary time, food skills and equipment to prepare meals from relatively low-cost food staples and ingredients; it also assumes access to many grocery stores.

In 2008, the cost of the NFB increased 2.4% from a year earlier, and 9.4% since 2006. Over nine years, the total increase has been 27%, compared to an inflation rate of 21%. Taking account of drastic cuts to social assistance rates in 1995, the purchasing power of people on social assistance has been reduced by 40% since 1993.

Impact on Health

- Because of the high cost of housing and inadequate income, many Toronto residents are forced to choose between paying the rent and buying food and other necessities.
- After paying the rent, people living on low and/or fixed incomes do not have enough money left over for nutritious food and other basic needs.
- Individuals from low income households are more likely to report poor health and multiple chronic conditions, including major depression, heart disease, diabetes and high blood pressure.

Nutritious Food Basket—Toronto

Food and Shelter on a Social Assistance Household Budget

September 2008	One Person Household, Ontario Works (single male age 25-49)	Single Parent Household with 2 children, Ontario Works (female age 25-49, boy age 13, girl age 7)	Reference Family of Four, Ontario Works (male & female age 25-49, boy age 13, girl age 7)	One Person Household, Ontario Disability Support Program (single male age 25-49)
Financial Benefit[1]	$560.00	$967.00	$1,084.00	$999.00
Additional Benefits/Credits[2]	$20.00	$698.00	$698.00	$27.00
Total monthly income	**$580.00**	**$1,665.00**	**$1,782.00**	**$1,026.00**
Cost of Shelter (Average Monthly Rent)	$742.00 (Bachelor)	$1,072.00 (2 Bdr.)	$1,275.00 (3 Bdr.)	$742.00 (Bachelor)
Cost of Food (Based on Toronto NFB 2008)	$205.00	$432.00	$590.00	$205.00
What's left for other basic needs? (e.g. household and personal care items, clothing etc.)	**-$367.00**	**$161.00**	**-$83.00**	**$79.00**

[1]No financial benefit other than OW or ODSP. [2]Additional benefits/credits include Federal/Provincial child benefits and GST credit, (where applicable). For more information and details on the above calculations please visit www.toronto.ca/health (click on 'N' for Nutritious Food Basket in the A-Z index).

Weekly Cost of the Nutritious Food Basket in Toronto (May 2008)

Nutritious Food Basket—Toronto

How to Calculate the Food Costs of a Nutritious Food Basket *

Follow the steps below to find out the cost of a weekly nutritious food basket.

STEP 1:
Write down the age and sex of all the people you are feeding.
For example:

Man, 37 years old and Woman, 37 years old
Boy, 13 years old and Girl, 7 years old

STEP 2:
Write down the cost of feeding each person.

STEP 3:
This is your subtotal.

STEP 4:
It costs a little more to feed a small group of people and less to feed a large group. Use the following adjustments for household size:

1 person – multiply by 1.15
2 people – multiply by 1.10
3 people – multiply by 1.05
4 people – make no change
5 people – multiply by 0.95
6+ people – multiply by 0.90

STEP 5:
To determine the cost per month, multiply by 4.33

Example

Sex	Age (years)	Cost Per Week ($)
Man	37	**41.21**
Woman	37	**30.15**
Boy	13	**39.11**
Girl	7	**25.81**
Subtotal		**$136.28**
TOTAL		**$136.28** x no adjustment = **$136.28** x 4.33= **$590.09/month**

Example: Reference Family of 4, Toronto (May, 2008)

Your Household

Sex	Age (years)	Cost Per Week ($)
Subtotal		
TOTAL		

Age/Sex/Group		Cost Per Week
Child	1	16.13
	2-3	17.12
	4-6	22.71
Boy	7-9	26.97
	10-12	33.51
	13-15	39.11
	16-18	45.33
Girl	7-9	25.81
	10-12	30.85
	13-15	32.90
	16-18	31.03
Man	19-24	42.68
	25-49	41.21
	50-74	37.23
	75+	33.80
Woman	19-24	31.68
	25-49	30.15
	50-74	29.54
	75+	28.76
Pregnancy		
Age	13-15	
Trimester 1		36.38
Trimesters 2,3		38.46
Lactation		39.67
Age	16-18	
Trimester 1		36.09
Trimesters 2,3		38.94
Lactation		40.03
Age	19-24	
Trimester 1		35.26
Trimesters 2,3		37.70
Lactation		38.67
Age	25-49	
Trimester 1		33.75
Trimesters 2,3		35.88
Lactation		36.67

* The cost of the Nutritious Food Basket is based on the 66 food items collected from 12 stores across the City.The software program automatically adds 5% to the basket cost to cover the cost of miscellaneous foods used in meal preparation, e.g., spices, seasonings, condiments, baking supplies, coffee/tea.

Nutritious Food Basket—Toronto

Nutritious Food Basket(NFB) Pricing Results for Toronto

Household Size	Nutritious Food Basket Pricing Results –2003
Family of four: two parents, boy 13 years, girl 8 years	$118.24/week $511.98/month
Single male, 35 years	$ 36.24/week, $156.92/month
Widowed female, 70 years	$ 25.91/week, $112.19/month
Mother, 24 years with child, 2 years	$ 41.93/week, $181.55/month

- The results from June 2003 indicate that food costs have decreased by about 2.27% since the June 2002 survey.
- The first NFB was priced in 1999, since then the food prices have increased by more than 9.67%.

Table 1 Weekly Cost of the Nutritious Food Basket in Toronto (June, 2003)

Sex	Age (years)	Cost Per Week ($)
Child	1	13.61
	2-3	14.40
	4-6	18.91
Boy	7-9	22.98
	10-12	28.48
	13-15	33.59
	16-18	39.31
Girl	7-9	22.04
	10-12	26.10
	13-15	28.10
	16-18	26.87
Man	19-24	37.29
	25-49	36.24
	50-74	32.83
	75+	29.76
Woman	19-24	27.53
	25-49	26.37
	50-74	25.91
	75+	25.17
Pregnancy		
Trimester 1	13-15	31.01
Trimesters 2,3		32.75
Lactation		33.67
Trimester 1	16-18	31.09
Trimesters 2,3		33.33
Lactation		34.22
Trimester 1	19-24	30.28
Trimesters 2,3		32.29
Lactation		33.05
Trimester 1	25-49	28.98
Trimesters 2,3		30.72
Lactation		31.34

Nutritious Food Basket—Toronto

How to Calculate the Food Costs of a Nutritious Food Basket

Follow the steps below to find out the cost of a weekly nutritious food basket. Use Table # 1 to complete calculations for your family or group. Table #2 shows an example of how much it will cost a family of four. Use Table #3 to complete calculations for another household.

STEP 1: Write down the age and sex of all the people you are feeding.
For example: Man, 40 years old
Woman, 38 years old
Boy, 13 years old
Girl, 8 years old

STEP 2: Using Table #1, write down the cost of feeding each person.

STEP 3: This is your subtotal.

STEP 4: It costs a little more to feed a small group of people and less to feed a large group. Use the following adjustments for household size:
1 person – multiply by 1.15
2 people – multiply by 1.10
3 people – multiply by 1.05
4 people – make no change
5 people – multiply by 0.95
6+ people – multiply by 0.90

STEP 5: **To determine the cost per month, multiply by 4.33**

Table 2 Example: Reference Family of 4, Toronto (June, 2003)

Sex	Age (years)	Cost Per Week ($)
Man	40	36.24
Woman	38	26.37
Boy	13	33.59
Girl	8	22.04
Subtotal =		118.24
TOTAL		118.24 x no adjustment = 118.24 x 4.33= **511.98 /month**

Nutritious Food Basket—Toronto

Table 3 Your Household

Sex	Age (years)	Cost Per Week ($)
Subtotal =		
TOTAL		_____ x __ adjustment = _____ x 4.33=_____ **/month**

How to Use the Nutritious Food Basket Information

- Acts as an effective tool to raise awareness about the cost of healthy eating
- Provides information that can be used to promote and support policy development to increase access to healthy foods
- Helps an individual, family or group estimate the cost of healthy eating
- Helps to compare the cost of healthy eating to other basic living expenses, such as housing/shelter, transportation, clothing and child care in relation to income
- Serves as an educational tool to teach budgeting in family studies courses and home management programs

Rice and Peas

2 cups	water	500 mL
1 cup	rice	250 mL
½ tsp	salt	2 mL
1	medium onion, cleaned and chopped	
1	clove garlic, minced	
½ tsp	dried thyme	2 mL
¼ tsp	pepper	pinch
pinch	cayenne (optional)	pinch
1	can(19 oz/540 mL)pigeon peas, rinsed and drained	1
1 tbsp	vegetable oil	15 mL

1. Place the water, rice and salt in a saucepan. Turn the heat to high and bring to a boil. Cover, reduce the heat to low and continue to cook for 10 minutes.
2. Prepare the onion and garlic.
3. Heat the vegetable oil in a frying pan over medium heat. Add the onion and garlic and sauté until softened. Stir in the thyme, pepper, cayenne and pigeon peas.
4. Pour the pigeon pea mixture over the rice, cover and cook over low heat for another 15 minutes or until the rice is tender. Fluff the rice gently to mix.

Serves 4 Costs: $0.29 per serving

For more information, contact:
Family Health & Healthy Lifestyles Intake, 416-338-7600

TORONTO Public Health

Nutritious Food Basket—Northwestern Ontario

The Cost of Feeding a Family Continues to Rise!

How do we figure out the cost of eating in Northwestern Ontario?

In June 2005, the Northwestern Health Unit partnered with 21 grocers to price the cost of the Nutritious Food Basket, the provincial government's food costing tool, in the Kenora-Rainy River Districts. The basket contains 66 food items thought to support nutritional health and reflect the shopping behaviours of Canadians. The food basket prices items like breads, cereals, noodles, crackers, cookies, milk, cheese, yogurt, and fresh, frozen and canned vegetables and meats. The basket does not contain low-nutrient snack foods such as potato chips and pop. Non-food items such as hygiene products, toilet paper, detergent or diapers are also not included. The items in the basket require basic cooking skills.

Results for 2005

In 2005 it would have cost $670.46 a month to feed a family of four in the Kenora-Rainy River Districts. The cost of the nutritious food basket in the Kenora-Rainy River Districts has increased by 16% since 1998.

In that same time, minimum wage and Ontario Works has not increased at the same pace. General minimum wage increased 4.4% in 2004 and is scheduled to increase 4.2% in 2005. In 2004, Ontario welfare and disability rates received a 3% increase for the first time in 11 years. These increases can not match the growing cost of the nutritious food basket.

What's inside...

November 2005

The Cost of Eating in the Kenora-Rainy River Districts

Table 2
Weekly cost of eating

The Cost of the Ontario Nutritious Food Basket (2005)

Group	Age	Cost per Week ($)
Child	1 year 2-3 years 4-6 years	18.06 19.31 25.80
Boy	7-9 years 10-12 years 13-15 years 16-18 years	30.99 38.05 44.30 51.26
Girl	7-9 years 10-12 years 13-15 years 16-18 years	29.53 34.92 37.41 35.44
Man	19-24 years 25-49 years 50-74 years 75+ years	48.51 46.76 42.17 38.12
Woman	19-24 years 25-49 years 50-74 years 75+ years	36.16 34.25 33.52 32.54
Pregnancy Trimester 1 Trimesters 2,3 Lactation	13-15 years	 40.88 43.11 44.56
Trimester 1 Trimesters 2,3 Lactation	16-18 years	40.57 43.61 44.90
Trimester 1 Trimesters 2,3 Lactation	19-24 years	39.68 42.36 43.49
Trimester 1 Trimesters 2,3 Lactation	24-49 years	37.97 40.34 41.27

Table 3

Estimated Food Costs per Household (2005)

Gender	Age	Weekly Food Cost
Women	38	$ 34.25
Man	38	$ 46.76
Boy	13	$ 44.30
Girl	9	$ 29.53
	Sub Total	**$ 154.84**
	Adjustment Factor	**no change**
	TOTAL	**$ 154.84**
	Monthly TOTAL	**$ 670.46**

For more information please call your local Northwestern Health Unit

Northwestern Health Unit

www.nwhu.on.ca

How does Northwestern Ontario compare?

The cost of the nutritious food basket in Northwestern Ontario has been consistently higher than the Ontario average. In 2004 the nutritious food basket cost over $1500 more per year than the rest of Ontario. This coupled with the fact that the 2004 average income in Northwestern Ontario was approximately $5000 less than the rest of Ontario can make healthy food choices difficult.

A family of four depending on Ontario Works or minimum wage as their income source would have to spend at least half of their total income on food. This leaves very little money for rent, transportation, clothes, hygiene products and other expenses. Unfortunately, when money is tight, healthy food choices tend to be the first things that are given up. People are forced to select less expensive, less nutritious foods or even go without.

In 2004 the nutritious food basket cost over $1500 more than the rest of Ontario.

How do these results affect our health?

Food quality and quantity are often the first things to be affected when families struggle to make rent and bill payments. When families don't have enough food to eat or enough money to buy healthy foods they are more likely to be sick and depressed. These individuals are more likely to develop health problems such as heart disease, diabetes, high blood pressure and food allergies.

What can be done to reduce poverty?

- Better jobs and a higher minimum wage; increase Ontario Works and Ontario Disability to a level that allows people to select healthy foods.
- More affordable housing to give families a chance to live and raise children in a safe and healthy environment.
- Improve upon tax transfers to those in need. Canada defines itself as a "helping" nation; let's help those who need it most in Canada.
- A strong child benefits system that allows working parents to continue working and support their children and families.

- Government recognition that the Kenora-Rainy River Districts have unique challenges in combating poverty.

Estimating the Average Weekly Cost of Healthy Eating

The cost of eating is different depending on a person's age and sex. To estimate the average weekly cost of healthy eating per household in Northwestern Ontario, follow these steps:

Step One
Write down the gender and age of each person in the household in Table 1.

Step Two
Write in the weekly cost of each person found in Table 2.

Step Three
Add the weekly food costs together.

Step Four
It costs a little more to feed a small group than a large group. Use the following adjustments for household size:

1 person – multiply by 1.15
2 people – multiply by 1.10
3 people – multiply by 1.05
4 people – no change
5 people – multiply by 0.95
6 people – multiply by 0.90

Step Five
To determine the cost per month, multiply by 4.33.

Table 1

Estimated Food Costs per Household

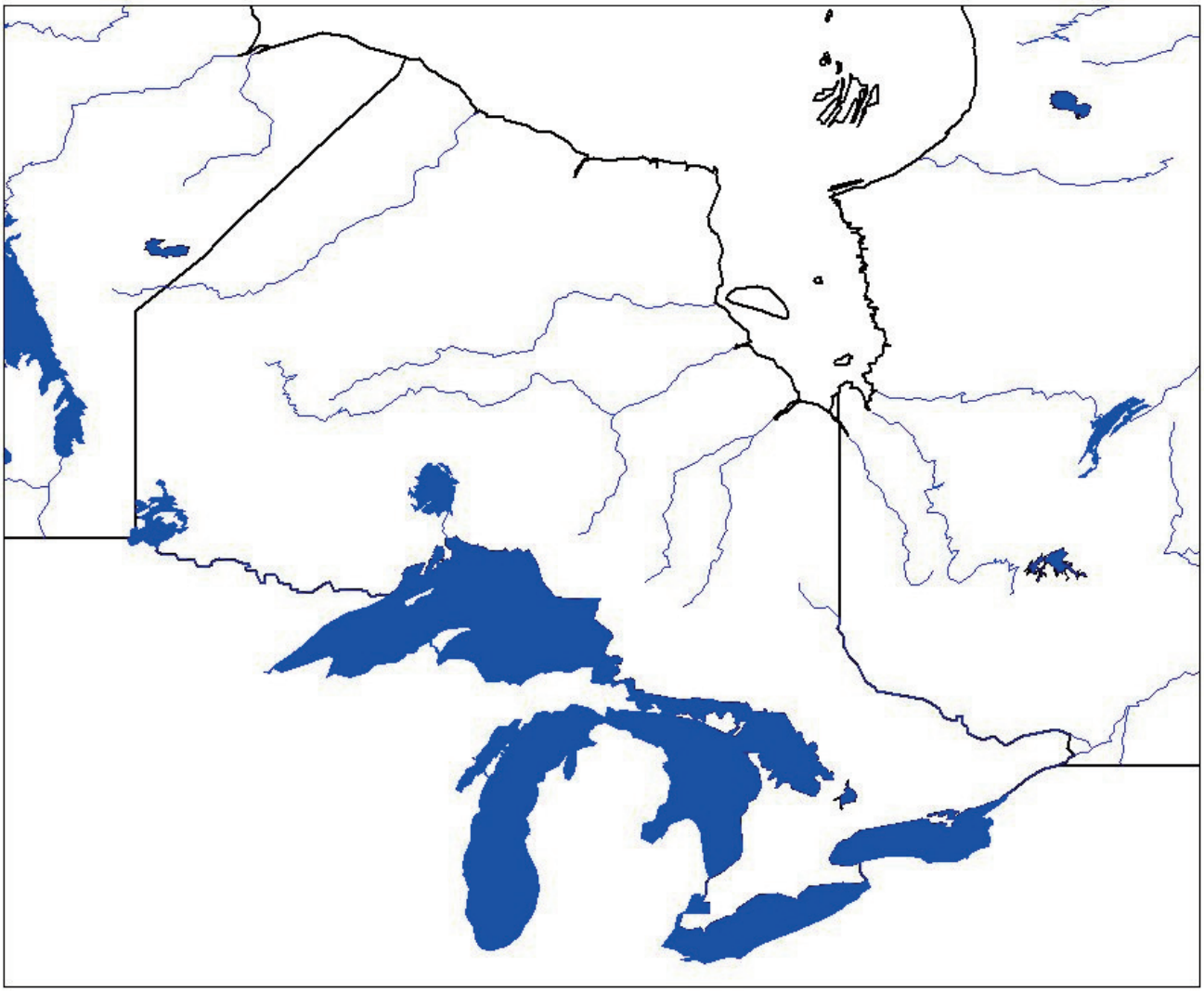
Gender	Age	Weekly Food Cost ($)
Subtotal		
Adjustment Factor		
Total		
Monthly Total		

Caution: These calculations are meant to be a guideline for what you could be spending to e healthy. It does not guarantee that you will be healthy by spending this amount of money. Following *Canada's Food Guide to Healthy Eating* is the key to a healthy diet.

Food Bank Usage by Geographic Centre

Record the Median Income and Food Bank Usage for the following Metropolitan Census areas:

City	Median Income	Food Bank Usage
Peterborough		
Ottawa		
Windsor		
Cambridge		
Oshawa		
Moosonee		
St. Catherines		
Elliot Lake		
Timmins		
Barrie		
Toronto		
Kenora		
Kingston		
Cornwall		
London		
Thunder Bay		
Sudbury		
Collingwood		
Belleville		



Who's Hungry—2008 Profile of Hunger in the GTA

SUBPOPULATIONS ACCESSING FOOD BANKS

	2008
PEOPLE WITH DISABILITIES	
Clients who say they have a disability or serious illness	47%
People who did not use a food bank before they became disabled	64%
People with disabilities who are not on ODSP (Ontario Disability Support Program) or CPP-D (Canada Pension Plan-Disability)	48%
Average length of food bank use (compared to 8 months in the rest of the sample)	24 mos
PEOPLE EXPERIENCING PERSISTENT POVERTY	
Clients who experience persistent poverty (more than two years of food bank use)	29%
Those who experience persistent poverty who have a disability	65%
Clients who are 45 years or older	55%
SINGLE PARENTS	
Clients who are single parents	19%
Single parents who are female	89%
Parents who could not enter the work force due to cost and/or access to daycare	44%
IMMIGRANTS	
Clients who were born outside of Canada	46%
Percentage of this group that has been in Canada for four years or less	39%
Non-Canadian born food bank clients who have either graduated from college or university or have a post-graduate degree (versus 16% Canadian born)	37%
WORKING POOR	
Households using food banks that have at least one person working	28%
Median hourly wage	$10.36
Median number of hours per week worked by food bank clients	25 hrs
Working food bank clients who lack drug or dental benefits	80%

AT A GLANCE

	2008
GTA FOOD BANK USE	
People served by a neighbourhood food banks	952,883
Increase since 2007	5%
Increase from 1995	90%
Average number of people relying on food banks per month	79,407
Percentage of food bank clients who are children (compared to 37 % in 2003)	34%
Percentage of food bank clients who are singles (compared to 37% in 2003)	47%
SCOPE OF HUNGER IN THE GTA	
Clients who have used a food bank for one year or less	57%
Clients who have used a food bank for more than two years	29%
Children who go hungry at least once a week	13%
Adults who go hungry once a week	33%
HUNGER: THE COST OF LIVING	
Median monthly household income	$967
Income spent on rent	77%
People who pay market rent	72%

Daily Bread Food Bank

Daily Bread Food Bank
191 New Toronto Street
Toronto, ON M8V 2E7

Tel: 416-203-0050
Fax: 416-203-0049
www.dailybread.ca

4th Course. **FOOD OR FUEL?**

Estimated time

4.5 classes of 75 minutes

Overall expectations

By the end of this activity students will be able to:

- create graphs and analyze data
- understand the origin of many common food additives
- make critical choices about the types of food that they consume
- understand the issues that surround the use of ethanol
- understand the positions of various stakeholders in the ethanol debate

Enduring understandings

Students will be able to understand the various issues with using ethanol as a source of fuel. They will be made aware of the various ways of producing ethanol and be able to debate the concept of using food for fuel in a world where so many people are still without adequate nutrition. In addition, students will have improved their teamwork skills as they work on tasks as part of a group.

Prior learning

1. How to create graphs (either using a spreadsheet program or by hand) if you will have the students create their own graphs.
2. When different types of graphs should be used (line, pie, stacked bar, simple bar and XY scattergraph) if you will have the students create their own graphs.
3. How to write a proper paragraph.

Getting ready

A. What in the world is ethanol?

1. If showing the Common Threads DVD, book the TV/DVD player. If showing the PowerPoint presentation, book the data projector. A hard copy of the Powerpoint is included after the lesson BLMs. If using the information handout, photocopy the "Ethanol Information Handout" (BLM 4A-1) for each student.
2. Photocopy the "Ethanol Worksheet" (BLM 4A-2) for each student.

B. Statistics and graph analysis

1. Photocopying:

a) If the students will create their own graphs: Photocopy the "Ethanol Statistics" handouts (BLM 4A-3, BLM 4A-4, BLM 4A-5, and BLM 4A-6). Each student receives one "Ethanol Statistics" handout, so that the 4 sets of statistics are equally divided amongst the students.

b) If you will provide the graphs to the students: Photocopy the "Ethanol Statistics Solution" handouts (BLM 4A-7, BLM 4A-8, BLM 4A-9, and BLM 4A-10). Each student receives one "Ethanol Statistics Solution", so that the statistics are equally divided amongst the students.

2. Book the computer lab if the students will be using a spreadsheet program to create the graphs.
3. Have chart paper and markers available.

C. You are what you eat: That's so corny!

1. Photocopy "What's in your kitchen?" (BLM 4A-11) for each student and "Corn Flow Chart" (BLM 4A-12) for each group.
2. Cut up pieces of paper for each group (each piece should be about 1/8 the size of a piece of "letter" paper): 12 pieces of white paper and 12 pieces of coloured paper for each group.
3. Have chart paper, scissors, glue and markers available.

D. Stakeholder Debate

1. Have chart paper and markers available.
2. Book the computer lab.
3. Photocopy "Ethanol Stakeholders" (BLM 4A-13) for each student.
4. Have a "talking stick" ready for each heterogeneous debate group of 6 students.

E. Debrief

1. No preparation needed.

Teaching & learning strategies

A. What in the world is ethanol? (30 minutes)

1. Inform students that they will be investigating the issue of ethanol. Let them know, at this point, only that ethanol is a fuel made from plants. Tell the class to stand up. Tell the class to line up in a line that ranges from "Strongly agree" at one end to "Strongly disagree" at the other end, according to their opinion on the following statement: "Ethanol should be used in Canada." Next, slide the line. To do this, cut the line in half and move one half of the line forward so that students are paired up. This means that students with strong opinions will be paired with someone of a more moderate opinion. Give each student 30 seconds to explain his/her position to a partner.
2. Provide the students with some background on ethanol in one of three ways:

a) Show the section of the Common Threads DVD that deals with ethanol.
b) Show the Common Threads Ethanol PowerPoint presentation
c) Give the students the Ethanol Information handout (BLM 4A-1)

3. As the students watch the video or presentation or as they read the handout, they should fill out the Ethanol Worksheet (BLM 4A-2).
4. Take up the worksheet with the class using the solution file for BLM 4A-2.

B. Statistics and graph analysis (75 minutes)

1. Review with the students the proper use of the following types of graphs: Line (to show change over time), Bar (to compare discrete data), Pie (to show what percentage different parts contribute to a whole), Stacked Bar (to show what percentage different parts contribute to a whole when there are several "wholes") and XY Scattergraph (to compare two sets of data to see if there is a relationship or correlation).
2. Provide each student with one of the four sets of Ethanol Statistics (BLM 4A-3, BLM 4A-4, BLM 4A-5, or BLM 4A-6) so that the statistics are evenly divided amongst the students. Take students to the computer lab. Each student should follow the instructions on their handout to create and print a graph. Alternatively, the students could create the graphs by hand in the classroom if a computer lab is not available. Alternatively, the Ethanol Graphs could be provided to the students if you do not wish them to create the graphs on their own (BLM 4A-7, BLM 4A-8, BLM 4A-9, and BLM 4A-10). Note: the statistics and finished graphs are also included as an Excel spreadsheet (Ethanol graphs.xls).
3. Group the students into groups of 3 or 4 so that each student within the group has created the same graph (homogenous groups). The students should work with their group to describe the patterns or trends shown in the graph and to explain why they think these patterns or trends exist.
4. Re-group the students into groups of 4 so that there is one student in each group who completed each type of graph (heterogeneous groups). Each student within the group, in turn, shares the information gained about ethanol from their graph.
5. Provide each group with a piece of chart paper and four markers. The students should divide their chart paper into two columns: Pros and Cons. They will then work with their group to list what they have learned from the graphs about ethanol in the appropriate columns. They should then continue to brainstorm other pros and cons of ethanol.
6. After about 5–10 minutes, each group should select a "spy" who will travel around the classroom, "spying" on the other groups. The "spies" will then return to their groups to share what they have learned from the other groups' charts. You might also want to help the students with some ideas (refer to the "Graphs Pros and Cons Solutions" file, BLM 4A-14).
7. Give the students time at the end of class to summarize their findings in their own notes.

C. You are what you eat: That's so corny!

(75 minutes)

1. As a homework activity, give each student a copy of "What's in your kitchen?" (BLM 4A-12). Students are to go home and list foods that do and do not contain corn or corn products.
2. The following day, students will bring their completed "What's in your kitchen?" worksheets to class. Have students share their findings with the class so that others can add to their lists. You might want to provide some ideas if students are stuck (refer to the solution file for BLM 4A-12).
3. Group the students into groups of 4. Provide each group with 24 small pieces of paper (each about 1/8 the size of a piece of "letter" paper)—12 pieces should be white paper and the other 12 pieces should be coloured paper. The groups will write the names of 12 different foods containing corn products from their lists—one each on the coloured pieces. Then they will write the names of 12 different foods that do not contain corn products from their lists—one each on the white pieces.
4. Next, the students will work with their groups to divide the foods into different groupings. Each time they finish a grouping, the students should note where the foods containing corn products ended up and discuss what that tells them about the use of corn in food production.

- Groupings:

a) Processed foods vs. Fresh foods
b) Canned foods vs. Boxed foods vs. Bottled foods vs. Other packaging
c) 4 food groups: Milk products vs. Meats vs. Fruits/Vegetables vs. Grains
d) High-calorie foods vs. Low-calorie foods
e) High-fat foods vs. Low-fat foods

5. Select a representative from each group to share with the class what they have learned about the use of corn in food production. You might provide some ideas if students are stuck (refer to the solution file for BLM 4A-12).
6. Emphasize with the students how many foods rely on corn as an ingredient. Ask the class what would happen if corn production dropped. (Responses might include: less food produced, hunger, higher food prices, switching to other food sources, etc.) Tell the students that, while corn production has not dropped, some of it has been diverted from food production to the production of ethanol. This might have some of the same impacts they listed previously.
7. Give each group a copy of the activity, "Corn Flow Chart" (BLM 4A-12), a piece of chart paper, 4 markers, glue and a pair of scissors. The students will work with their groups to complete the instructions on the activity sheet in order to understand the impact that using corn to produce fuel has on food production. You might provide some ideas if students are stuck (a possible solution has been provided—refer to the solution file for BLM 4A-12).
8. Once the groups have finished the activity, select one student from each group to hold up and share their group's results. Conclude with a general discussion of how ethanol affects food production.
9. Ask students to write a short reflection about their food choices and whether today's lesson will make them think more about the types of food that they consume and why.

D. Stakeholder Debate (2 75 minute periods)

1. Divide the class into 6 equal groups—if you find these groups are too big, subdivide them (3 or 4 students per group is ideal). Assign each group the role of one of the 6 stakeholders (homogeneous groups):

a) Corn farmer
b) Soft drink manufacturer
c) Minimum-wage worker
d) Environmentalist
e) Oil company executive
f) Ontario Minister of Agriculture

Give each group a piece of chart paper and 4 markers.

2. Take the students to the computer lab. The groups will use the information that they have

learned in this unit, along with information that they gain from research on the internet, to answer the following questions on their group's piece of chart paper: Who is their stakeholder? How does this stakeholder feel about the use of ethanol? Why do they have this opinion?

3. Post the finished pieces of chart paper around the classroom. Give each student a copy of the worksheet, Ethanol Stakeholders (BLM 4A-13). The students will then take a "gallery tour" by walking around the classroom and recording the information on their Ethanol Stakeholders handout. You might provide some ideas if students are stuck (refer to the solution file for BLM 4A-13).
4. The students will then return to their stakeholder groups. They will work with their group to prepare for the debate, from the perspective of their stakeholder. The debate will be based on the statement, "Crops should not be used to produce fuel." They will need to:

a) Be clear about how their stakeholder feels about ethanol and why.
b) Write a brief (approximately 20 second) opening statement that states their position.
c) Determine convincing arguments for their position, in order to try to convince others of their position.
d) Anticipate arguments that other stakeholders will make (referring to their Ethanol Stakeholders worksheet will help with this) and come up with counter-arguments.

5. Re-group the students into groups of 6 so that there is one representative from each stakeholder group in each group (heterogeneous groups). Provide each group with an object that can be used as a "talking stick." In order to speak, a student needs to have the "talking stick" in their hand. The groups will debate the statement, "Crops should not be used to produce fuel." The debate will begin with each student, in turn, making an opening statement. Debate will then proceed—as a student wishes to speak, s/he picks up the "talking stick" and makes an argument. After a set amount of time, tell the groups that the debate will be ending. Allow each group to vote on the statement, "Crops should not be used to produce fuel" to determine the winning side.
6. As a follow-up to the debate, students will write two proper paragraphs. The first paragraph will outline their stakeholder's position on the issue of ethanol and the reasons for this opinion. The second paragraph will outline the student's own position on ethanol and his/her own reasons for this opinion.

E. Debrief (5–10 minutes)

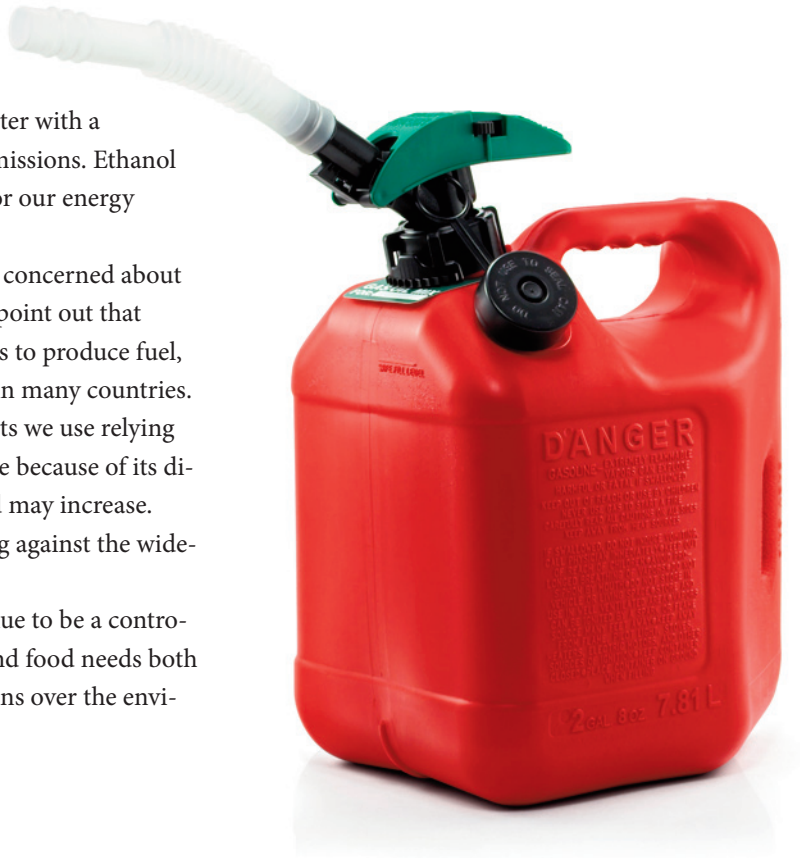
1. The following day, in order to debrief the unit on ethanol, repeat the "line-up" activity that was done at the start of the unit to see how students' positions have changed and why. Tell the class to stand up. Tell the class to line up in a line that ranges from "Strongly agree" at one end to "Strongly disagree" at the other end, according to their opinions on the statement: "Ethanol should be used in Canada." Next, slide the line. To do this, cut the line in half and move one half of the line forward so that students are paired up. This means that students with strong opinions will be paired with someone of a more moderate opinion. Give each student 60 seconds to:

a) Explain his/her position to a partner
b) Indicate whether his/her position changed from the start of the unit on ethanol
c) Explain why his/her position has or has not changed

Ethanol Information

Ethanol is a clear, colourless, flammable liquid made out of oxygen, hydrogen and carbon. It is also called ethyl alcohol. Ethanol can be used as an alternative to fuel. Ethanol can be made from a variety of crops, most frequently corn and sugarcane. However, it can also be made from wheat, rye and potatoes. Cellulosic ethanol can be made from switchgrass or corn stalks (not food crops). The process of manufacturing ethanol includes fermentation, distillation and dehydration. This is very similar to the process for creating wine and beer. In general, ethanol is very simple to manufacture.

Many people feel that ethanol is the answer to some of our energy problems. When compared with gasoline, it does seem to have a lot of advantages. Ethanol requires less energy to manufacture than gasoline. It uses a renewable resource, while gasoline does not. It also produces fewer greenhouse emissions than gasoline. Ethanol made from corn produces up to 52% less emissions while ethanol made from sugarcane fares even better with a 78% reduction in greenhouse gas emissions. Ethanol would seem to be a good solution for our energy needs.



Many other people, however, are concerned about the growing usage of ethanol. They point out that cropland is being used to grow crops to produce fuel, rather than the food that is needed in many countries. As well, with so many of the products we use relying on corn, if there is less corn available because of its diversion to fuel, then the cost of food may increase. Some critics therefore are cautioning against the widespread use of ethanol.

It is clear that ethanol will continue to be a controversial topic as the world's energy and food needs both continue to grow, along with concerns over the environment and global warming.

Ethanol Worksheet

1. What is ethanol?

2. What is ethanol used for?

3. What is ethanol made from?

4. How is ethanol manufactured?

5. What are some of the advantages of manufacturing and using ethanol?

6. What are some of the disadvantages of manufacturing and using ethanol?

Ethanol Worksheet—Solutions

1. What is ethanol?
   Ethanol is a clear, colourless, flammable liquid made out of oxygen, hydrogen and carbon. It is also called ethyl alcohol.

2. What is ethanol used for?
   Ethanol can be used as an alternative to fuel.

3. What is ethanol made from?
   Ethanol can be made from a variety of crops, most frequently corn and sugarcane. However, it can also be made from wheat, rye and potatoes.

4. How is ethanol manufactured?
   The process of manufacturing ethanol includes fermentation, distillation and dehydration. This is very similar to the process for creating wine and beer. In general, ethanol is very simple to manufacture.

5. What are some of the advantages of manufacturing and using ethanol?
- Ethanol requires less energy to manufacture than gasoline.
- It uses a renewable resource, while gasoline does not.
- It also produces fewer greenhouse emissions than gasoline.

6. What are some of the disadvantages of manufacturing and using ethanol?
- Cropland is being used to grow crops to produce fuel, rather than the food that is needed in many countries.
- With so many of the products we use relying on corn, if there is less corn available because of its diversion to fuel, then the cost of food may increase.

Ethanol Statistics 1

1. Examine the set of data below. Decide what type of graph would best display the data. Choices: Line, Bar, Pie, Stacked Bar and XY Scattergraph.
2. Use the spreadsheet program to create a fully-labeled graph of this data. Add your name to the graph and print it.

USES OF THE U.S. CORN CROP—2007

Use	Percentage
Feed/Residual	45.0%
Ethanol	25.0%
Exports/Shipments	19.0%
High-fructose corn syrup	4.1%
Starch	2.2%
Glucose/Dextrose	1.9%
Cereals/Other products	1.5%
Alcoholic beverages	1.1%
Seed	0.2%

Source: AFDC

Ethanol Statistics 2

1. Examine the set of data below. Decide what type of graph would best display the data. Choices: Line, Bar, Pie, Stacked Bar and XY Scattergraph.
2. Use the spreadsheet program to create a fully-labeled graph of this data. Add your name to the graph and print it.

CARBON DIOXIDE PRODUCTION BY FUEL TYPE

Fuel Type	Carbon Dioxide (grams/Megajoule of energy)
Wheat Ethanol (Canada)	69
Sugar Cane Ethanol (Brazil)	18
Corn Ethanol (average)	76
Natural Gas (average)	62
Diesel (average)	86
Gasoline (average)	85
Coal (average)	112

Source: UK Department for Transport

Ethanol Statistics 3

1. Examine the set of data below. Decide what type of graph would best display the data. Choices: Line, Bar, Pie, Stacked Bar and XY Scattergraph.
2. Use the spreadsheet program to create a fully-labeled graph of this data. Add your name to the graph and print it.

FOSSIL ENERGY REQUIREMENTS for PRODUCING DIFFERENT FUELS (BTU)

Requirements	Gasoline	Corn Ethanol	Cellulosic Ethanol
Petroleum	1.1	0.1	0.1
Coal and Natural Gas	0.1	0.6	0.1

Source: U.S. Department of Energy

Ethanol Statistics 4

1. Examine the set of data below. Decide what type of graph would best display the data. Choices: Line, Bar, Pie, Stacked Bar and XY Scattergraph.
2. Use the spreadsheet program to create a fully-labeled graph of this data. Add your name to the graph and print it.

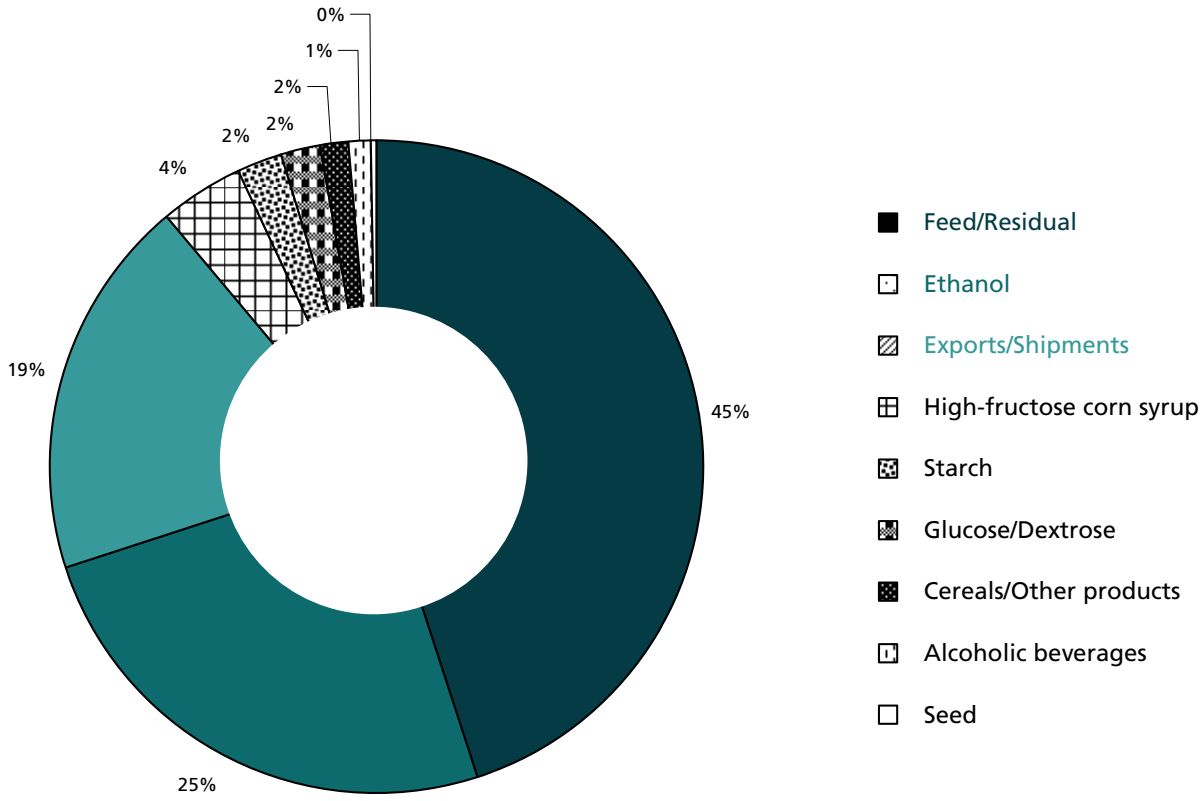
CANADIAN FARM PRODUCT PRICE INDEX (1997=100)

Year	Total Crops	Total Livestock	Total Index
1997	100.0	100.0	100.0
1998	96.9	94.2	95.5
1999	87.8	96.2	92.1
2000	84.3	105.2	95.0
2001	93.1	110.5	102.0
2002	109.3	103.4	106.1
2003	105.1	98.0	101.3
2004	100.6	98.3	99.4
2005	88.8	104.0	97.1
2006	93.5	101.2	97.7
2007	117.0	101.5	108.3
2008	140.4	103.6	120.0

Source: Statistics Canada

Ethanol Statistics 1—Solutions

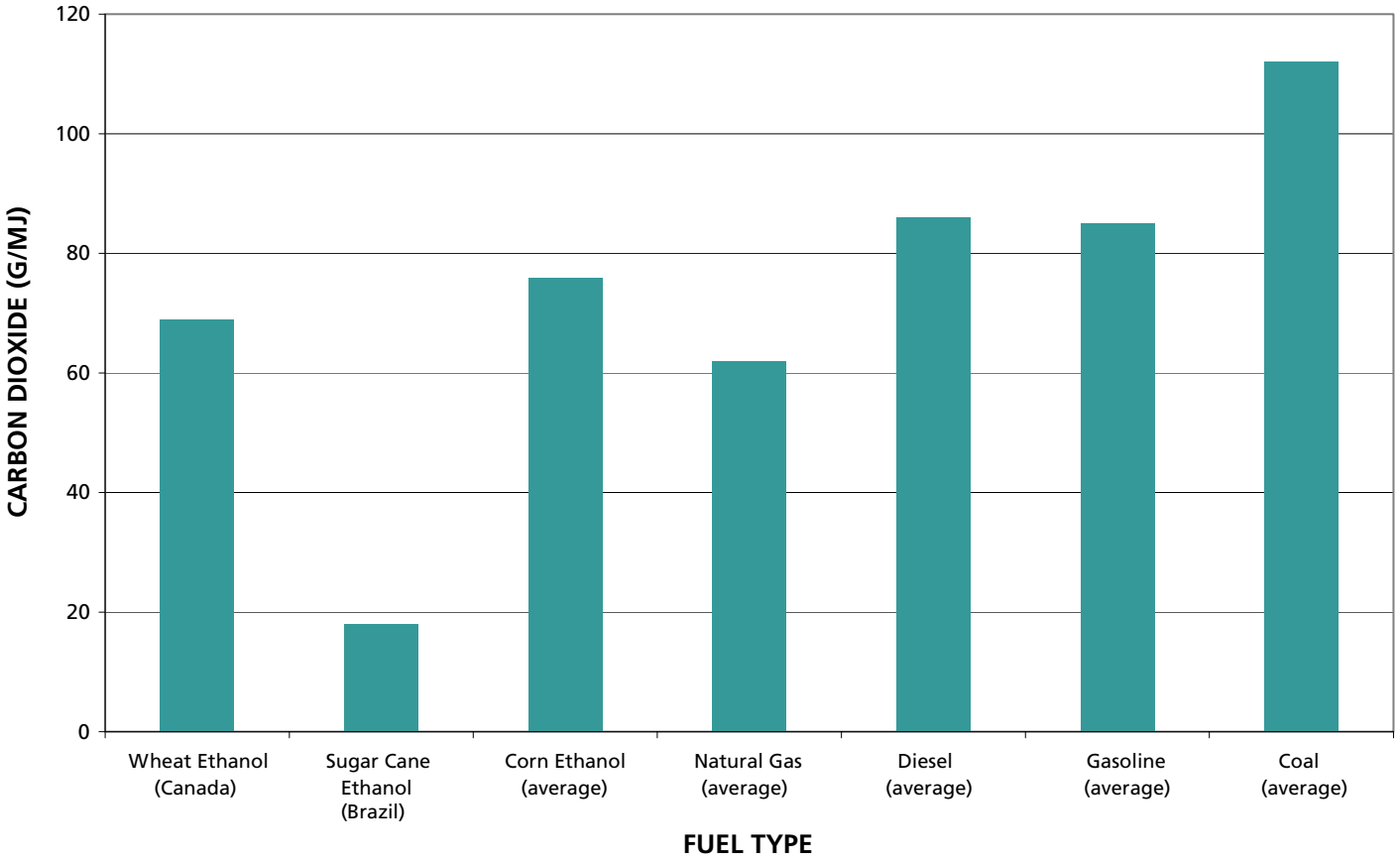
USES OF THE U.S. CORN CROP—2007



Source: Statistics Canada

Ethanol Statistics 2—Solutions

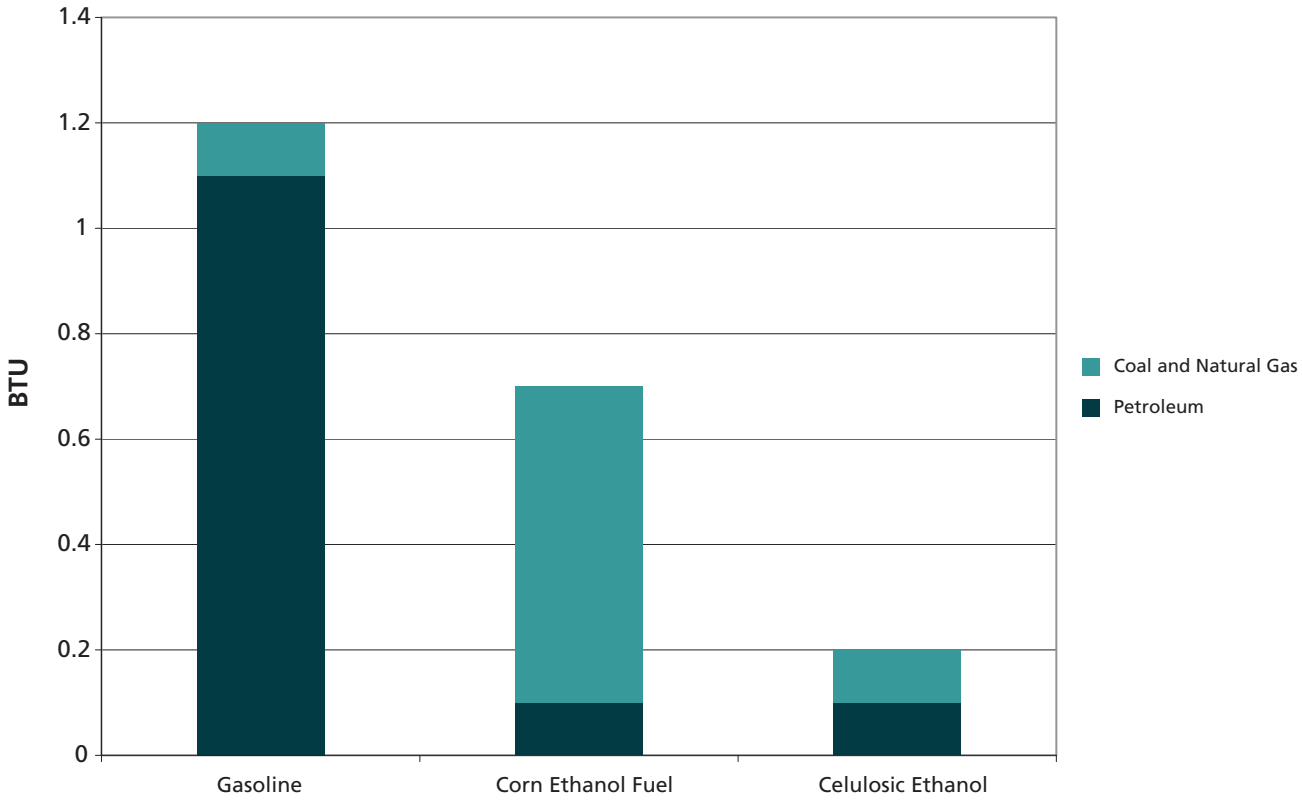
CARBON DIOXIDE PRODUCTION BY FUEL TYPE



Source: UK Department for Transport

Ethanol Statistics 3—Solutions

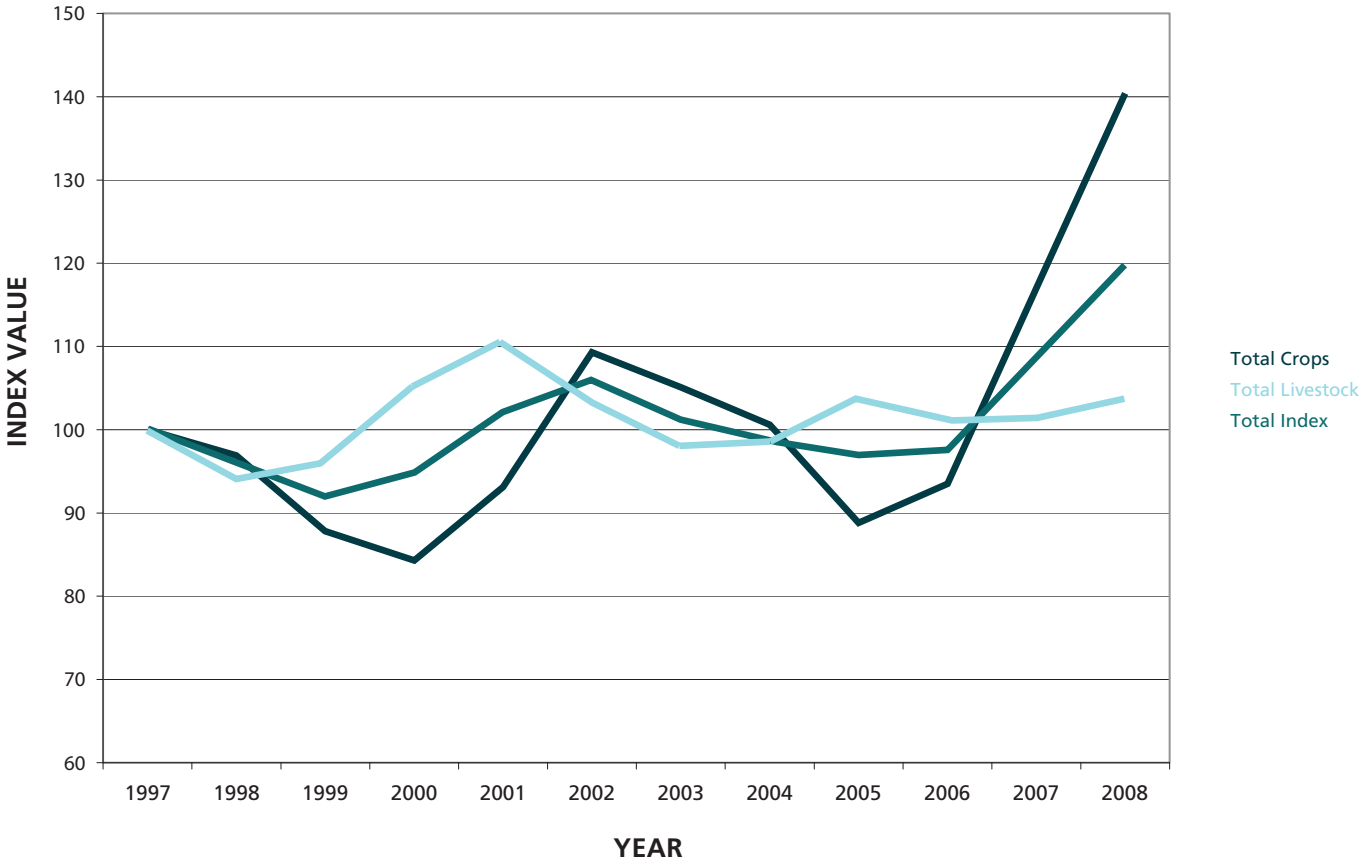
FOSSIL ENERGY REQUIREMENTS for PRODUCING DIFFERENT FUELS



Source: U.S. Department of Energy

Ethanol Statistics 4—Solutions

CANADIAN FARM PRODUCT PRICE INDEX (1997=100)



Source: Statistics Canada

What's in your kitchen?

Search through your cupboards and fridge in order to determine what foods do and do not contain corn products. Read the ingredients label on the packaging to see if you can find any corn products in the ingredients list.

Corn products include: Corn, Corn oil, Corn meal, Corn starch, Corn syrup, Dextrose, Ethyl alcohol, Glucose, High-Fructose corn syrup (HFCS), Maltodextrin, Starch (unless specified as another kind), Xanthan gum

FOODS WITH CORN PRODUCTS	FOODS WITHOUT CORN PRODUCTS

What's in your kitchen?—Solution

Search through your cupboards and fridge in order to determine what foods do and do not contain corn products. Read the ingredients label on the packaging to see if you can find any corn products in the ingredients list.

Corn products include: Corn, Corn oil, Corn meal, Corn starch, Corn syrup, Dextrose, Ethyl alcohol, Glucose, High-Fructose corn syrup (HFCS), Maltodextrin, Starch (unless specified as another kind), Xanthan gum

a) Processed foods vs. Fresh foods: More corn products are processed
b) Canned foods vs. Boxed foods vs. Bottled foods vs. Other packaging: More corn products are packaged in various ways
c) 4 food groups: Milk products vs. Meats vs. Fruits/Vegetables vs. Grains: More corn products are grains or desserts
d) High-calorie foods vs. Low-calorie foods: More corn products are high-calorie foods
e) High-fat foods vs. Low-fat foods: More corn products are high-fat foods

FOODS WITH CORN PRODUCTS		FOODS WITHOUT CORN PRODUCTS	
Baked beans	Licorice	Apple sauce	Hamburger
Baking powder	Margarine	Apples	Jam
Beer	Marshmallows	Bananas	Lettuce
Bread	Mayonnaise	Beans	Milk
Breakfast cereals	Mustard	Butter	Pasta
Canned soup	Peanut butter	Canned fruit	Peaches
Chili sauce	(processed)	Carrots	Peanut butter (pure)
Chocolate sauce	Plum sauce	Chicken	Peas
Corn chips	Potato chips	Coffee	Rice
Crackers	Salad dressing	Cottage cheese	Shrimp
Ice cream	Soft drinks	Cucumbers	Steak
Ketchup	Soya sauce	Fish	Strawberries
Lemon pie filling	Sweet pickles	Grape juice	Tomatoes
	Yoghurt		

Corn Flow Chart

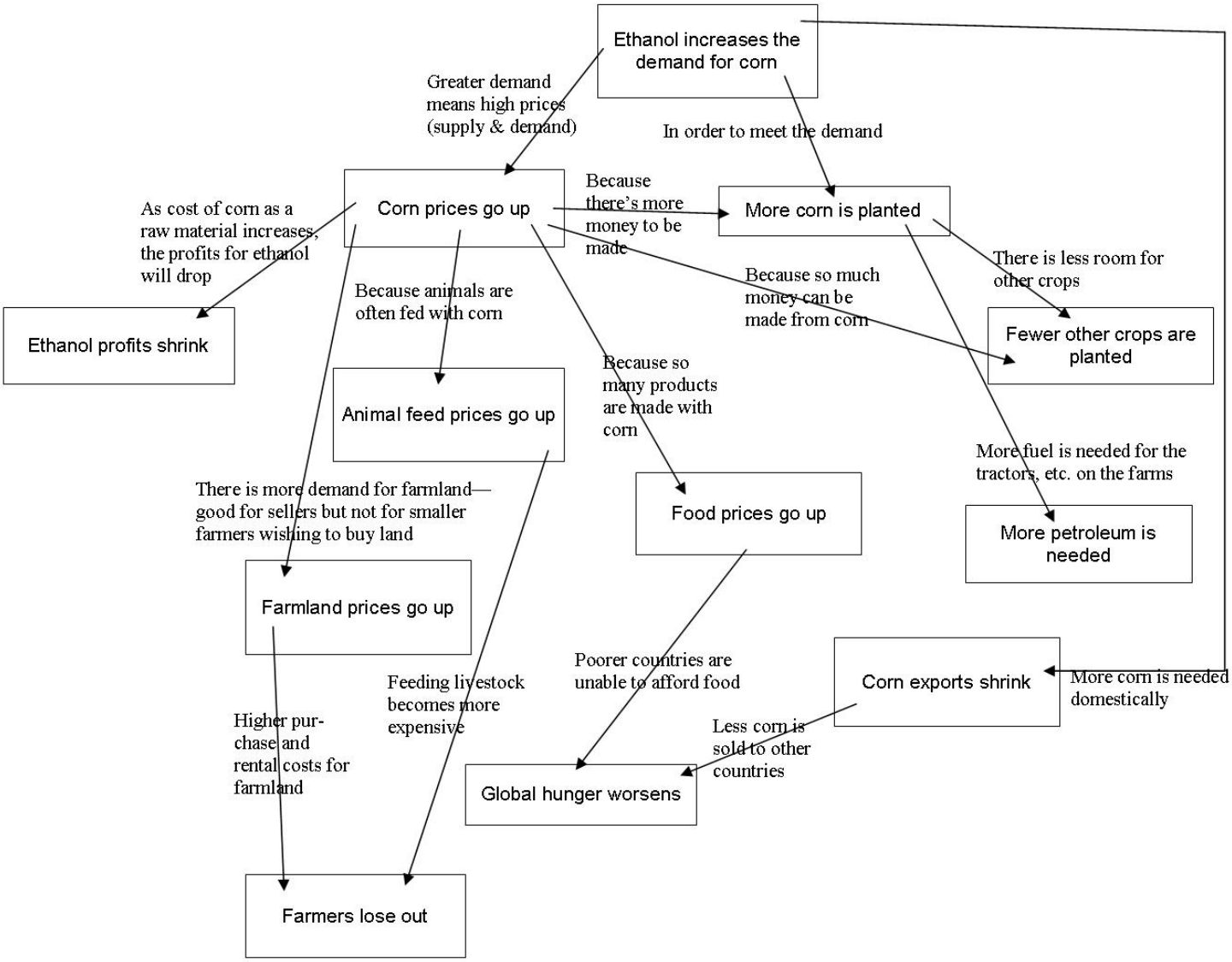
Instructions

1. Cut out each of the event cards, spread them out on the chart paper and glue them down
2. Use arrows to connect the different events to show how one event can cause another. Along the arrow, explain how the event is causing the other event. Remember, one event may have many causes and/or might impact on several other events. Your group might consider starting with the event card for "Ethanol increases the demand for corn."

Event Cards

Ethanol increases the demand for corn	Animal feed prices go up
More petroleum is needed	Corn exports shrink
Fewer other crops are planted	Farmers lose out
Global hunger worsens	Farmland prices go up
More corn is planted	Food prices go up
Ethanol profits shrink	Corn prices go up

Corn Flow Chart—Solution



Ethanol Stakeholders

Use the information on the chart paper to complete the following chart in order to analyze the opinions of various stakeholders on ethanol.

Stakeholder	Opinion on Ethanol	Reason for Opinion
Corn farmer	**Mostly in favour**	• more demand for crops • higher price for crops • can expand production • however, costs increase as well
Soft drink manufacturer	**Mostly against**	• higher price for corn, which is a raw material • less corn available • smaller profit margin
Minimum-wage worker	**Mostly against**	• food prices increase • possible food shortages
Environmentalist	**Mostly in favour**	• ethanol requires less fossil fuel to manufacture • fewer greenhouse gases are produced • however, ethanol still produces greenhouse gases
Oil company executive	**Mostly against**	• if people start buying more ethanol, fewer people will buy gasoline • profits will go down
Minister of Agriculture	**On the fence**	• more money is being made by the agricultural sector • more markets for corn crops • however, more mono-cropping of corn may occur • farmland prices go up (tough for small farmers)

Graphs Pros & Cons—Solutions

PROS	CONS
Selling corn for ethanol is a good source of income for farmers	Ethanol is diverting 25% of corn production
Sugarcane ethanol produces the least amount of greenhouse gases of all the fuel types	Only 11% of corn production goes to producing food—and of that, only 2% is for cereals
Wheat, sugarcane and corn ethanol all produce fewer greenhouse gases than diesel, gasoline and coal	Wheat and corn ethanol both produce a significant amount of greenhouse gases (both are more than natural gas)
Cellulosic ethanol requires very little fossil fuels for its production	Corn ethanol requires a significant amount of fossil fuels in its production
Both corn and cellulosic ethanol require less fossil fuels for production than gasoline	Corn ethanol requires more coal for its production than gasoline (and coal is the "dirtiest" fuel)
Higher prices for livestock and crops mean more income for farmers	Higher prices for livestock and crops means more expensive foods for consumers

Common Threads IV – Ethanol

What is ethanol?

- Also called ethyl alcohol
- A flammable, colourless liquid
- Can be used as a fuel, as an alternative to gasoline
- Easy to manufacture

Common Threads IV – Ethanol

Making Ethanol

- Ethanol can be made from a variety of crops, including corn and sugarcane

Corn

Sugarcane

Common Threads IV – Ethanol

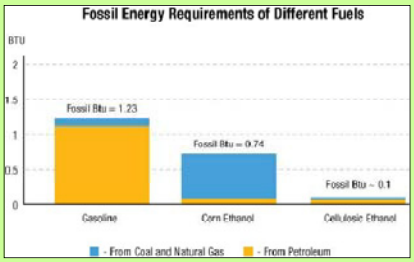
Making Ethanol

- The process includes fermentation, distillation and dehydration

Fermentation of sugarcane

Common Threads IV – Ethanol

Ethanol vs. Gasoline



Ethanol requires less energy to manufacture than gasoline.

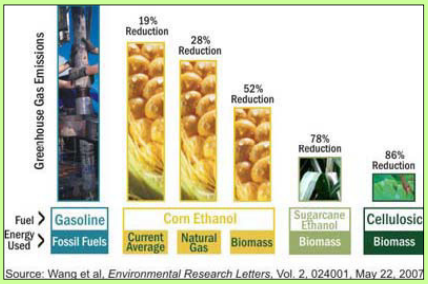
Common Threads IV – Ethanol

Ethanol vs. Gasoline

Ethanol uses a renewable resource, while gasoline does not.

Common Threads IV – Ethanol

Ethanol vs. Gasoline



Source: Wang et al, *Environmental Research Letters*, Vol. 2, 024001, May 22, 2007

Ethanol produces fewer greenhouse gas emissions than gasoline.

Common Threads IV – Ethanol

However…

Common Threads IV – Ethanol

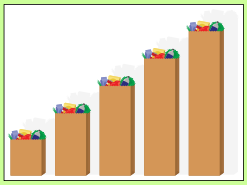
Ethanol and Food

- One of the concerns with ethanol is that crop land is being used for producing fuel, rather than the food that is needed in many countries

Common Threads IV – Ethanol

Ethanol and Food

- Because so many of the products we use rely on corn, if there is less corn available because of its diversion to fuel, then the cost of food may increase.



Common Threads IV – Ethanol

What do you think of ethanol?

Common Threads IV – Ethanol

5th Course. **THE FUTURE OF FOOD**

Estimated Time Required

One 75 minute class

Overall Expectations

By the end of this lesson students will be able to:

- Define what is meant by the "global food crisis."
- Identify the nature and significance of the global food crisis.
- Assess and describe potential causes for the global food crisis.
- Present possible solutions at the personal, local, national, and global levels.

Enduring Understandings

Students will understand the origins, nature, and impact of the global food crisis in a broad global context.

Prior Knowledge

These activities can be adapted to stand alone or be used in conjunction with the other lessons in this unit.

Getting Ready

1. Prepare BLMs for each lesson as needed.
    - BLM 5A-1 Fact Sheet 1—Oil
    - BLM 5A-2 Fact Sheet 2—Ethanol
    - BLM 5A-3 Fact Sheet 3—Climate Change
    - BLM 5A-4 Fact Sheet 4—Meat Production
    - BLM 5A-5 Fact Sheet 5—Grain Stocks
    - BLM 5A-6 Fact Sheet 6—Money Markets

Adapted from World Vision's *A Hungry World.*

Teaching and Learning Strategies

Background Information

Today's food crisis is different from the food emergencies of the past. The rise in food prices threatens the security and well-being of millions of people around the world. Over the last two years 100 million people, 35 million of them children, have been pushed into extreme poverty and live in hunger.

Unlike food emergencies of the past, which were largely weather related and were limited in geography and time, today's food crisis is the result of rising fuel prices and long-term climate change. As a result, today's food crisis is much wider in scope—affecting people and countries all around the world—and has no end in sight.

The drastic and continuing rise in the price of food, which has gone up 83% since 2005, has resulted in food riots and other forms of social unrest in Haiti, Bangladesh, and even developed countries. The plight of the food crisis is being disproportionately felt by the world's most vulnerable populations; particularly women and children in developing countries.[1]

1. Graffiti Wall: Write a provocative question or statement about the food crisis on the board before students enter the classroom. As students enter the room, ask them to write a word, phrase, or response under the statement. Use the response to discuss the perception about hunger and food to introduce facts and statistics about global food insecurity. Suggestions for graffiti wall:

a. "If my family could no longer afford food, I would..."
b. "There are people in the world so hungry that God cannot appear to them except in the form of bread."—Indira Gandhi, former Indian Prime Minister
c. "In 2007, 923 million people worldwide were undernourished, of which 907 million lived in developing countries."

2. Expert Groups Jigsaw: Divide the class into six "expert" groups. Each group should be assigned one of the six fact sheets on the causes of global food insecurity. (BLM 5A-1 to 6)
3. In groups, students read and discuss their assigned fact sheet to answer the discussion questions. Each group member takes notes during the discussion and writes responses to questions.
4. Students then number themselves off within the group and form new breakout groups that include one member from each of the six expert groups. In these new groups the "experts" share information about each food insecurity factor, to answer the questions corresponding to all the factors.
5. Each group should then propose possible solutions for each factor. Their solutions should be recorded on a "What Can be Done?" table.
6. The teacher should ask each group to share their solutions with the class.

Fact Sheet 1—Oil

Facts About Oil

- Oil is a non-renewable resource and the basis of modern industrial economies.
- Scientists estimate that within the next few decades the demand for oil will exceed production and reserves will run out.
- Countries with the largest oil reserves are: Saudi Arabia, Canada, Iran, Iraq, Kuwait, United Arab Emirates, Venezuela, Russia, Libya, and Nigeria.
- Wars over oil have been fought in Kuwait, Iraq, Nigeria, and Sudan; as oil reserves are depleted, wars over this resource could increase.
- Increased worldwide consumption of oil and gas results in emissions of greenhouse gases, which cause climate change.

Links Between Oil and Food Insecurity

- Oil prices have risen six-fold since 2002; they are predicted to double again by 2012, sending gas prices to $2.25 CAD a litre.[2]
- Improving economies in China and India have increased their demand for oil to support manufacturing and production; improved living standards in these countries have created more demand for personal vehicles and fuel.
- Production of crop fertilizers requires large amounts of oil and natural gas; the rise in the price of oil has resulted in the cost of fertilizer doubling between fall 2007 and spring 2008.[3]
- Oil provides most of the energy to run farm machinery, so the rising cost of oil is increasing production costs for farmers.
- In our current global food system, food is mass produced in a few countries and exported to other countries around the world, requiring large amounts of oil for transportation; many people have adopted the 100-Mile Diet, which encourages buying and consuming food grown and produced within 100 miles of their homes as a way to reduce the use of oil in food transportation.
- Diminishing oil supplies, combined with growing awareness of the environmental impact of burning oil, has led to interest in the use of biofuels, such as ethanol, as alternatives; however, biofuels are produced using food sources such as corn and sugar cane, so diverting food crops for fuel contributes to smaller food reserves worldwide.

For Discussion

1. List the ways rising oil prices contribute to global food insecurity.
2. What are the benefits and drawbacks of oil use?
3. Countries in the West developed their economies with an almost unlimited use of global oil reserves. Should countries with emerging economies, such as China and India, restrict their consumption of oil in the face of diminishing supplies and environmental concerns? Why or why not?
4. What are the implications of a future oil crisis (i.e., diminishing supplies and rising prices) for the global economy? For Canada? What impact would an oil crisis have on you and your family?
5. What could be done to avert a future oil crisis?

Fact Sheet 2—Ethanol

Facts About Ethanol

- Ethanol, or ethyl alcohol, is a volatile, flammable, and colourless liquid that burns with a blue flame.
- It is found in alcoholic beverages and thermometers, but its single largest use is as fuel or a fuel additive.
- Ethanol is commonly blended with gasoline and used as a source of automobile fuel nicknamed "gasohol" (90 per cent gasoline and 10 per cent ethanol).
- The ethanol industry in Brazil is based on sugar cane; the US and Canada's ethanol industries are based on corn.
- Ethanol is a cleaner burning fuel source than oil, so it reduces greenhouse gas emissions that contribute to climate change.
- Ethanol is expensive to produce and requires intensive energy inputs; some scientists argue that the production of ethanol requires more energy than it ultimately yields.

Links Between Ethanol and Food Insecurity

- Ethanol is the source of much controversy: some people want to increase its production as a more efficient fuel additive (to cut greenhouse gases) and others argue that using crops for fuel rather than food has decreased the global food supply and contributed to rising food prices.
- In Canada, refiners are required to ensure five per cent ethanol content in their gasoline by 2010; the five per cent ethanol content regulation would reduce greenhouse gas emissions by 4.2 million tonnes annually, the equivalent of taking one million cars off the road.[4]
- Ontario is reconsidering its plan to require 10 per cent ethanol content in gasoline by 2010[5] due to concerns the corn-based fuel is boosting food prices.[6]
- Some analysts have blamed biofuels for pushing up food prices as much as 30 to 60 per cent, while others argue biofuels have only increased food prices two to three per cent.[7]
- Brazil's ethanol industry is based on using alcohol from sugar cane, which is not a food staple and is a more efficient source of ethanol than corn.
- Eco-agricultural specialists argue that other plant-based and non-food sources of ethanol production (such as switchgrass) are better alternatives.
- One person could be fed for a year on the corn needed to fill an ethanol-fueled SUV.[8]
- Farmers in some developed countries receive government subsidies to grow corn for ethanol; $11 to $12 billion US a year in subsidies and tariffs has diverted 100 million tonnes of cereals from human consumption.[9]

For Discussion

1. List the ways increased use of ethanol contributes to global food insecurity.
2. What are the benefits and drawbacks of ethanol use?
3. Debate whether the benefits of producing and using ethanol outweigh the costs to the global food supply.
4. Suggest ways for moving forward in ethanol production. Is it possible to balance the needs for transportation fuel with environmental sustainability and global food security?

Fact Sheet 3—Climate Change

Facts About Climate Change

- Average temperatures have climbed 0.8 degree Celsius around the world since 1880, much of this in recent decades, according to NASA's Goddard Institute for Space Studies.[10]
- The twentieth century's last two decades were the hottest in 400 years and possibly the warmest for several millennia, according to a number of climate studies; the United Nations' Intergovernmental Panel on Climate Change reports that 11 of the past 12 years are among the dozen warmest since 1850.[11]
- Average temperatures in Alaska, western Canada, and eastern Russia have risen at twice the global average, according to the Arctic Climate Impact Assessment report compiled between 2000 and 2004; Arctic ice is rapidly disappearing, and the region may have its first completely ice-free summer by 2040 or earlier.[12]
- Nine planet Earths would be required to absorb all the world's carbon if every poor person had the same energy-rich lifestyle as an American or a Canadian.[13]
- On average, one person out of 19 in a developing country will be hit by a climate disaster, compared to one out of 1,500 in a developed country.[14]
- In Niger, a child born during a drought is 72 percent more likely to be stunted than a child born during a normal season.[15]

Links Between Climate Change and Food Insecurity

- Several distinct weather incidents in recent years have resulted in reduced wheat and rice harvests; scientists have linked these weather patterns to the effects of climate change; examples:
- An extended drought in Australia's Murray-Darling Basin in 2006–2007 reduced Australian wheat production by 58 percent from the previous year.[16]
- A 2006 heat wave in California's San Joaquin Valley killed large numbers of livestock.
- In 2008, rains in Kerala, India, destroyed large swaths of grain.
- In May 2008, cyclone Nargis in Myanmar (Burma) destroyed much of the country's rice crop.
- It is estimated that by 2080, agricultural output in developing countries could decline by 20 percent and yields could decrease by 15 percent on average due to climate change leading to water scarcity.[17]
- Agricultural practices are a major contributor to greenhouse gas emissions (17 to 32 percent of greenhouse gas emissions are a result of agriculture or land use changes).[18]
- The production and use of synthetic fertilizers emit nitrous oxides, methane gas, and carbon dioxide into the atmosphere.
- Intensification of farming practices has resulted in a huge increase in fertilizer use.
- Other farm operations (e.g., tillage, seeding, application of agrochemicals, and harvesting) also emit carbon dioxide.
- Livestock production generates nearly one-fifth of the world's greenhouse gases, more than transportation[19]; 1 kilogram of beef produces the same amount of carbon dioxide emitted by the average European car every 250 kilometres.[20]

For Discussion

1. How do agricultural practices contribute to climate change? What can be done to lessen their impact?
2. Why do we continue to use fertilizers on a large scale to increase crop yields, when using more sustainable farming practices will be better for the environment in the long-run?
3. Suggest ways that the needs for an increased global food supply and environmental sustainability might both be met. Will trade offs be necessary? If so, which side do you favour and why?

Fact Sheet 4—Meat Production

Facts About Meat Production

- Livestock can be raised in different ways, but the majority of meat production in North America is done through factory farming rather than smaller-scale animal husbandry practices.
- The aim of factory farming is to produce as much meat as possible for the lowest financial cost; unfortunately, this often includes a high cost to the environment.
- On a global scale, the wealthy eat the most meat, often at the expense of poorer people who depend on staple food grains that are diverted to feed livestock.
- Developed countries have consumed more than their share of the global meat supply for many decades; the average daily meat consumption of Americans is eight ounces—roughly twice the global average.[21]

Links Between Meat Production and Food Insecurity

- As economies in developing countries are growing, demand for meat is also growing; demand for meat in China has doubled in the last two decades.[22]
- The majority of the corn and soybeans grown in the world is used to feed livestock rather than people—an increased demand for meat means an increased demand for grain.
- Producing one kilogram of chicken meat requires 3.4 kilograms of feed; one kilogram of pork requires 8.4 kilograms of feed.[23]
- Livestock production generates nearly one-fifth of the world's greenhouse gases, more than transportation[24]; one kilogram of beef produces the same amount of carbon dioxide emitted by the average European car every 250 kilometres.[25]
- An estimated 30 per cent of the Earth's land not covered in ice is used for livestock production.[26]
- Although a person can live on food grown on 0.2 hectares (0.5 acres) of land or less, it takes four football fields, or 1.6 hectares of land to feed one Canadian.[27]

- Animal waste contributes to nitrate, phosphorus, and nitrogen pollution in rivers and groundwater.
- Overgrazing of land contributes to soil erosion, deforestation, and greenhouse gases.
- Most of the world's rangelands are currently grazed at or beyond capacity; since the 1960s, one-third of the forests in Central America have been cut down for cattle grazing.[28]

Discussion

1. How does increased meat production and consumption contribute to global food insecurity?
2. What are the benefits and drawbacks of livestock production?
3. Consumption of meat in rich countries has reached an unsustainable level while at the same time people in the developing world are increasing both their income and their meat consumption. What can be done about this pressure on food supplies?
4. Overproduction of meat has resulted in two major global problems: reduction in food security for the world's poor and environmental degradation. What solutions would you propose for these problems?

Fact Sheet 5—Grain Stocks

Facts About Grain Stocks

- Grains, also called cereal crops, include maize or corn, rice, wheat, oats, barley, sorghum, and rye.
- Grains are grown in greater quantities than any other crop worldwide and provide more energy for the world's population than any other crop group.
- In developing countries, grain—in the form of corn or rice—comprises the majority of the population's diet.
- The United States, Australia, Canada, China, India, Russia, France, and Argentina are leading wheat exporters.
- Thailand, India, Vietnam, the United States, and Pakistan are leading rice exporters.
- The amount of grain exported each year depends on a number of factors, including weather conditions, harvests, and export controls placed by governments concerned about domestic supplies.

Links Between Grain Stocks and Food Insecurity

- Increasing demand for grain as livestock feed, extreme weather conditions, water scarcity, and low stockpiles have all resulted in rising grain prices.
- In January 2008, the FAO Food Price Index jumped by 47 per cent from the year before, led by increases in cereals (62 per cent), dairy (69 per cent), and vegetable oils (85 per cent).[29]
- Prices of nearly all food commodities have risen since the beginning of 2008 supported by a persistent supply and demand situation; rice prices gained the most, corn prices also made gains, and because of low stocks, wheat prices are well above 2007 levels.[30]
- An extended drought in Australia's Murray-Darling Basin in 2006–2007 reduced Australia's wheat production by 58 per cent from the previous year.[31]
- In May 2008, cyclone Nargis in Burma destroyed much of Burma's rice crop; the effects of the storm may mean that Burma will be forced to import rice for the first time.
- Grain stockpiles have been declining as a "just-in-time" inventory method—producing without stor ing large surpluses—has become the norm; in times of crisis this means fewer grain reserves to draw upon
- Government and private wheat reserves are at an all-time low; the world consumed more grain than it produced for the past eight years and grain stockpiles are only 40 days short of the next harvest from running out of food[32] (in 1998 and 1999, it was 116 days).[33]
- In order to feed their own populations, some governments have partially or completely restricted the exports of various foodstuffs (e.g. Argentina, Bolivia, Cambodia, China, and Vietnam).
- Prices for grain products have risen more than eight per cent in Canadian stores; Maple Leaf Foods Inc. raised the price of a loaf of bread by 40 cents.[34]

For Discussion

1. Why is the demand for grain increasing?
2. Why is the global supply of grain decreasing?
3. In order to prevent a worse situation of world hunger, global grain reserves need to be built up. However, stockpiling grain when prices are volatile leads to higher food prices and hoarding. What role should governments play in this situation?
4. Is it right for governments of grain-exporting countries to partially or completely ban exports in order to feed their own populations first? Or should they make the food needs of the global population their main priority?
5. Propose possible solutions to ensure global grain supplies are adequate both now and in the future.

Fact Sheet 6—Money Markets

Facts About Money Markets

- Capitalist economies are driven by money and making profits.
- One way people make money in capitalist systems is by playing the stock market and speculating that the price of a good or service will increase in the future—in other words, buying stocks while the price is low and selling when the price is high.
- The process of buying and selling stocks, bonds, currencies, real estate, commodities, or any other valuable financial instrument is called "financial speculation".
- Recent financial speculation in food commodities such as corn, wheat, soybeans, and rice has caused prices of these commodities to fluctuate.

Links Between Money Markets and Food Insecurity

- Due to the downturn in the US economy and the weakening US dollar, investors have recently removed money from equities and mortgage bonds and invested in food and raw materials, contributing to a sharp increase in prices of food commodities.
- The amount of money invested in food commodities has grown from $13 billion US in 2003 to $260 billion US in March 2008.[35]
- Speculators are betting on food scarcity in the future due to increasing corn production for ethanol, the effects of severe weather patterns, and the rising price of oil.
- Importing countries are being hit by higher food prices, which benefit large farming conglomerates in exporting countries; smaller scale farming operations producing for domestic markets benefit very little from food price increases.
- Mexico used to produce enough maize to supply its domestic market plus export a surplus, however, with pressure from the North American Free Trade Agreement (NAFTA) to open its market to imports, Mexico now imports 30 percent of its maize; meanwhile, speculation has driven up the cost of maize in the US, which has led to higher costs for Mexicans, causing a "tortilla crisis" for the Mexican poor.[36]

For Discussion

1. How does financial speculation contribute to global food insecurity?
2. Who profits from rising food commodity prices? Who suffers?
3. The buying and selling of food commodities turns food into a profit-making instrument for investors; however, food is also a basic human right that should be universally available to all. Debate the ethical and social implications of this situation.
4. Propose possible approaches to reduce the impact of financial speculation and global markets on global food shortages now and in the future.

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23 USDA, 1997, cited in Stephen Leckie, "How Meat-Centred Eating Patterns Affect Food Security and the Environment", International Development Research Centre (IDRC), 1999.

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33 James Randerson, "Food crisis will take hold before climate change, warns chief scientist", The Guardian, March 7, 2008.

34 Paul Waldie, "Why grocery bills will soar", Globe and Mail, April 25, 2008.

Estimated Time
1 to 3 lessons

Overall Expectations
To gain an understanding of the concept and purpose of permaculture and apply it on a local basis.

Enduring Understandings
Students should be able to explain the basic principles of permaculture.
Students should gain an appreciation for the local application of permaculture as an alternative to corporate and large-scale farming.

Prior Learning
- Students should have a working knowledge of local climate, soil and natural vegetation conditions.
- Students should have an understanding of local food crops and production.
- Students should have an understanding of the local environmental issues facing farmers.
- Students should have some experience with interpreting aerial photographs.

Getting Ready
This work can be completed using a Smartboard or as a pen and paper assignment. A Smartboard presentation and slide presentation are contained on the Hungry for Change resource CD. A print version of the Powerpoint is provided after the BLMs for this lesson.

Book a computer lab which provides access to Notebook (SmartBoard application). Copy the slideshow and Smartboard assignment on permaculture to a 'handout' folder on your computer network. Students can work through the slide show individually or it can be shown to the class with discussion of the key principles. Students should complete the planning sheets as they watch the slide show;
or use the PowerPoint (Demonstration Farm.ppt) to show to the class as they work through the lesson;
or provide students with a copy of the written script, BLM 5B-6.

If completing on paper or for planning prior to preparing work in Notebook, photocopy BLMs 5B-1 to 6.

BLM 5B-1 Principles of Permaculture
BLM 5B-2 Planning Your Permaculture Operation
BLM 5B-3 Aerial Photos of Land Area
BLM 5B-4 Permaculture Zone Planning Sheet
BLM 5B-5 Application of 5 Principles
BLM 5B-6 Written Script—Permaculture Demonstration Farm

Teaching & Learning Strategies

1. Have students work through the slideshow presentation on permaculture and Demonstration Farm. A hard copy of the slideshow is provided after BLMs for this lesson. Students should complete the paper copies of BLM 5B-1, Principles of Permaculture, or written script, BLM 5B-6. as they watch the slideshow—this will provide them with an understanding of the principles of permaculture. This will provide them with the basic means to create a permaculture operation that could be found in their local area.
2. Provide students with the BLMs for planning task (5B-2 to 6). Review the expectations with them. They should plan a local permaculture operation based on local soil, climate and vegetation conditions.

- BLM 5B-2 Planning Your Permaculture Operation
  Students are to identify the natural characteristics of the land shown and consider local soil, climate, and terrain conditions as they complete the organizer.
- BLM 5B-3 Aerial Photos of Land
  Aerial Photo of Land Area (students can use this as a planning sheet). They should work to divide the land area into zones based on the permaculture principles.
- BLM 5B-4 Permaculture Zone Planning Sheet (6th Principle)
  Students should use this organizer to identify what they place in each zone and why
- BLM 5B-5 Application of the 5 Principles
  Students should complete an assessment of their designs to ensure that they have used the 5 principles in an effective manner.

Students are to prepare a good copy of their map of the permaculture operation that they have designed, incorporating the key principles. This can be done individually, with a partner, or in a small group. Students can complete their plan on the electronic copy of the air photo (for a Smartboard presentation) or they could complete it on paper (using BLM 5B-3, Aerial Photo). The air photo could be enlarged or a larger map prepared of the area. All land area should have a use designated to it. All principles should be included and considered in the design.

3. Students should prepare a brief oral presentation to explain how and why they prepared their design.
4. As a class, discuss the challenges of using a farming technique, such as permaculture, in meeting our food needs.

Principles of Permaculture

State the principle and list its characteristics.

	Principle	Characteristics/Explanation
1		
2		
3		
4		
5		
6		

Planning Your Permaculture Operation

List the features of the land and indentify possible issues or problems with farming this land.

Existing Natural Features	Issues/Problems Observed

Aerial Photos of Land Area

Source: County of Middlesex, 2009

Permaculture Zone Planning Sheet

	Items to be included	Issues/Problems Observed
Zone 1 home		
Zone 2 fruit trees		
Zone 3 grains/larger animals		
Zone 4 restoration		

Application of 5 Principles

List examples of how your design meets each of the 5 principles.

5 Principles	Example	Example
Take care of the soil		
Respect Life		
Be aware of overconsumption		
Conserve energy		
Everything should have at least two uses		

Written Script—Permaculture Demonstration Farm

Overview

OSSTF sent a team of six Ontario teachers to Brazil during the summer of 2008. While there, the team visited a Demonstration Farm near the town of Araçuai. This town is located inland from Rio de Janeiro, in the state of Minas Gerais and has a population of around 36,000 people. Araçuai is situated in the Brazilian highlands. This is a very dry region with rocky soils. The main industry is mining—indeed, the translation of the state's name is "General Mines." Other industries include crafts, subsistence agriculture and cattle. Araçuai serves as the commercial and service centre for the region. This area has very high poverty rates and many people are leaving for other parts of Brazil, hoping to find employment.

Features of the Demonstration Farm

- A working farm where local family farmers can go and learn about techniques that work in their semi-arid climate
- Uses the concept of "permaculture"—"perma" stands for permanent (i.e. sustainable)
- Learning environment is such that even non-literate farmers can learn

Written Script—Permaculture Demonstration Farm

Principles of the Demonstration Farm

1. **Take care of the soil**

- Soil must be preserved and used in a sustainable way so that it will be available for future generations.
- We must recognize the inter-connections between the different components of the environment (e.g. water, soil, insects, plants etc.).

2. **Respect life**

- We must worry about providing for life, not producing money.
- We must respect nature and each other

3. **Be aware of over-consumption**

- We must not spend and consume too much in excess.
- We must learn not to waste and instead to re-use, compost and recycle.

4. **Set up the farm in zones**

- The farm, regardless of size, should be set up in zones where you apply the principles of permaculture
- Parts of the farm that are needed daily are located closest to the home
- Things that are not needed as often are further away from the home

Zone 1

- Contains the home and a 50 metre radius around the home
- Includes the bathroom, water tanks, vegetable garden and small animals
- These are all things that are needed or must be tended to more frequently

Zone 2

- Contains fruit trees
- Fruit can be further from the home because you don't need to tend them everyday (unlike the vegetables in the garden)

Zone 3

- Grains, such as corn or soya, depending on what the soil allows
- Larger animals that do not need to be tended to as frequently

Zone 4

- In Brazil, 20% of the land must be returned to its original state
- This zone is left to return to native plant species
- Sometimes reforestation takes place here

5. **Conserve energy**

- The farm is set up in such a way so as to conserve energy
- Energy should be conserved in terms of human labour, fossil fuels and electricity

6. **Everything must have at least two uses**

- In order to increase efficiency, everything on the farm must perform at least two functions
- For example, fruit trees provide both food and shade

Common Threads IV – Demonstration Farm

Overview

- A working farm where local family farmers can go and learn about techniques that work in their semi-arid climate
- Uses the concept of “permaculture” – “perma” stands for permanent (i.e. sustainable)
- Learning environment is such that even non-literate farmers can learn

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

1. Take care of the soil:

- Soil must be preserved and used in a sustainable way so that it will be available for future generations.
- We must recognize the inter-connections between the different components of the environment (e.g. water, soil, insects, plants etc.).

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

1. Take care of the soil:

Soil must be irrigated. At the Demonstration Farm they are using a pump to bring water from the river to the crops. In this way the soil is provided with its needs.

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

2. Respect life:

- We must worry about providing for life, not producing money.
- We must respect nature and each other

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

2. Respect life:

Ants were attacking some of their plants. Rather than kill the ants, they came up with a plan. They are protecting the plants using pop bottles so that the ants have difficulty getting at them. Meanwhile, they are planting other things that would attract the ants and provide food for them.

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

3. Be aware of over-consumption:

- We must not spend and consume too much in excess.
- We must learn not to waste and instead to re-use, compost and recycle.

Demonstration Farm Principles

3. Be aware of over-consumption:

Water is being filtered through various substances, including gravel and sand, so that it can be re-used on the farm.

Demonstration Farm Principles

4. Set up the farm in zones:

- The farm, regardless of size, should be set up in zones where you apply the principles of permaculture
- Parts of the farm that are needed daily are located closest to the home
- Things that are not needed as often are further away from the home

Demonstration Farm Principles

4. Set up the farm in zones:

- Zone One:
  - Contains the home and a 50 metre radius around the home
  - Includes the bathroom, water tanks, vegetable garden and small animals
  - These are all things that are needed or must be tended to more frequently

Demonstration Farm Principles

4. Set up the farm in zones:

- Zone One:

Farm house

Bathroom

Water storage tank

Small animals

Vegetable garden

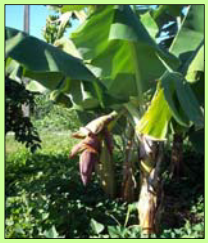
Demonstration Farm Principles

4. Set up the farm in zones:

- Zone Two:
  - Contains fruit trees
  - Fruit can be further from the home because you don't need to tend them everyday (unlike the vegetables in the garden)

Demonstration Farm Principles

4. Set up the farm in zones:
- Zone Two:



Fruit trees like bananas (left), durian (above right) and papaya (below right)

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

4. Set up the farm in zones:
- Zone Three:
  - Grains, such as corn or soya, depending on what the soil allows
  - Larger animals that do not need to be tended to as frequently

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

4. Set up the farm in zones:
- Zone Three:

Grains, like corn

Larger animals, like cattle

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

4. Set up the farm in zones:
- Zone Four:
  - In Brazil, 20% of the land must be returned to its original state
  - This zone is left to return to native plant species
  - Sometimes reforestation takes place here

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

4. Set up the farm in zones:
- Zone Four:

Zone 4 – Before revitalization

Zone 4 – After revitalization

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

5. Conserve energy:
- The farm is set up in such a way so as to conserve energy
- Energy should be conserved in terms of human labour, fossil fuels and electricity

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

5. Conserve energy:

Vegetables are planted in semi-circles so the farmer can stand in the middle and turn in place to irrigate, thus conserving energy.

Water is collected and stored in tanks to take advantage of gravity, rather than using fuel.

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

6. Everything must have at least two uses:

- In order to increase efficiency, everything on the farm must perform at least two functions
- For example, fruit trees provide both food and shade

Common Threads IV – Demonstration Farm

Demonstration Farm Principles

6. Everything must have at least two uses:

The "three sisters" provide food but also help each other – beans add nutrients to the soil, squash provides shade and humidity and corn provides climbers for the beans.

Composting toilets also provide fertilizer for the farm.

Common Threads IV – Demonstration Farm

Other Features of the Farm

"Teaching Huts"

Huts have been constructed using local, available materials. These provide shade for groups, such as local farmers or students, who have come to learn about permaculture.

Common Threads IV – Demonstration Farm

Other Features of the Farm

"Greenhouse"

A "greenhouse" is built with black perforated cloth hung over an A-frame. During the rainy season, the perforations let the rain through, without crushing the plants. The black cloth blocks out the strong rays of the sun.

Inside the "greenhouse" seedlings are started before being transplanted outside.

Common Threads IV – Demonstration Farm

Other Features of the Farm

"Fish Farm"

They are experimenting with creating a fish pond and breeding fish.

Common Threads IV – Demonstration Farm

Common Threads IV – Demonstration Farm

Estimated Time

2 lessons (150 minutes)

Overall Expectations

By the end of these activities, the students will be able to:

- compare the concepts of food security and food sovereignty
- apply these concepts to the Brazilian and Canadian systems

Enduring Understandings

Students will be able to identify the issues of food security and food sovereignty both in an international context and within Canada.

Prior Learning

Students should have been introduced to the concepts of food security and sovereignty.

Getting Ready

- If needed, book a projector for the PowerPoint presentation.
- Copy the BLMs needed for the lesson.
- Book a computer lab for student research on local organizations involved in food security issues.

BLM 5C-1 Food security vs. sovereignty definitions
BLM 5C-2 Brazil—'Hunger Zero' Case Study
BLM 5C-3 Food Sovereignty—'Hunger Zero' Case Study
BLM 5C-4 What Canada is doing to meet its food security needs

Teaching & Learning Strategies

Day 1 Food Sovereignty—The Hunger Zero Case Study (1 lesson)
Have the students compare the terms food security and food sovereignty, BLM 5C-1 overhead with definitions. Review with the students that:
Sovereignty should include the following rights:

- to prioritize local agriculture production in order to feed local people and not for export
- for peasants and landless people to access land, water, seeds and credit
- of farmers to produce food
- for consumers to be able to decide what they consume (+ culturally appropriate food), and choose how and by whom it was produced
- to protect from low-priced food and food imports by having the right to impose taxes on excessively cheap imports
- to farm sustainably
- the recognition of the role of women in agricultural production
- to participate in developing agricultural policies

Source: adapted from UN—What is food sovereignty?

Give each student a copy of BLM 5C-3, the Hunger Zero Case Study. Show the Hunger Zero PowerPoint and have the students complete Part A of the worksheet as they view the slideshow, or provide the students with the script (BLM 5C-2) on the Hunger Zero case study. Have students work in pairs or a small group and complete Part B. A hard copy of the Hunger Zero Powerpoint is provided after the BLMs for this lesson.

Day 2 The Canadian Situation—Meeting our food security needs
Divide students into small groups. Provide students with a copy of BLM 5C-4, "What is Canada doing to meet its food security needs". They will research a group that works with food security and sovereignty in Canada (a computer lab is needed or students can be asked to complete their research as homework).

Once they have shared their research with the group, the group will make recommendations on what the local needs are for food security/sovereignty and solutions that they would suggest be implemented. Share ideas with the class.

Food Security vs. Food Soverignty—Definitions

FOOD SECURITY

According to the Food and Agriculture Organization, food security exists "when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life."

Source: library.thinkquest.org/05aug/00282/other_glossary.htm

FOOD SOVEREIGNTY

This is the right of a person, or country, to determine its own agricultural systems and food policies without outside intervention.

Brazil—'Hunger Zero' Case Study

The following is the script to be read during the slide show—Hunger Zero Program

Overview

OSSTF sent a team of six Ontario teachers to Brazil during the summer of 2008 to study the issue of food security and to learn about Brazil's "Hunger Zero" program. The Hunger Zero team visited two communities and learned about the "Hunger Zero" program that has been implemented in Brazil. The first community was the city of Belo Horizonte, located inland from Rio de Janeiro, in the Brazilian highlands. BH, as it is known, has a population of over two million people. The second community visited by the team was the town of Araçuai. Located a little farther north, and also inland, this smaller town has a population of around 36,000 people. These two communities, both located in the state of Minas Gerais, provided a good contrast and overview of the "Hunger Zero" projects being implemented.

The "Hunger Zero" programs are guided by these general principles:

- Food is a basic human right—Therefore it must be provided for those who cannot afford it
- Use fresh, healthy food—Food security is not just about making food available, but also about
- Use locally grown produce—This ensures that local farmers are supported, reduces transportation costs, and limits the environmental impact of food production
- Remove the stigma from using these programs—People should not feel embarrassed when accessing the programs
- Make the programs available to all—This is one way to remove the stigma that can sometimes be attached to food programs in other places
- Make people self-sufficient, not dependent—It is important that solutions for addressing hunger deal with the underlying causes of the problem

Hunger Zero Programs

1. **Food Bank**

- Unlike Canada, Brazil's Food Banks cater to institutions, not individuals (e.g. orphanages, programs for young mothers, community centres, etc.)
- **Based entirely on donations**
- Dept. of Sanitation collects potential food waste from grocery stores and brings it to the Food Bank for sorting
- Mostly fresh fruits and vegetables

2. **Farm to City Markets**

- Located in key neighbourhoods
- Organized by the municipality
- Each farmer has two days/week
- Mostly fruits, vegetables and baked goods
- Eliminates the "middle man"
- Like a very small-scale farmer's market

3. **Craft Markets**

- Set up in government buildings (e.g. Tax Centres, Social Service Centres, etc.)
- These are places with un-used spaces (e.g. lobbies) where many people come on a daily basis
- Products include crafts, sweets & clothing
- Eliminates the "middle man"

Brazil—'Hunger Zero' Case Study

4. **Family Farms**
- This is a government program
- Landless families are able to claim land that is not being worked by the owners
- This brings more land into production
- The landless people are able to work the land and eventually purchase the property
- These family farms provide food for the Farm to City markets and Craft markets

5. **Farmers' Markets**
- Operate usually on Sundays
- Local farmers come and bring fruits, vegetables and animals/meats to sell
- Food is fresh and cheaper than at supermarkets
- Provides a market for the smaller-scale farmers
- In addition, crafts, baked goods and clothing are sold

6. **Sacolão (Big Bag) Stores**
- These are grocery stores around the city
- 20 items are designated "Sacolão" items and their price is set at R$0.69/kg (about $0.52 Canadian)
- These items change throughout the year, depending on what's in season
- Other fruits and vegetables are also priced more cheaply than at other stores
- This encourages healthy eating of seasonal products from local farmers

7. **School Meals Program**
- Lunch is provided to every student in the country
- They try to use fresh, not processed, foods
- Schools use foods grown in their own gardens
- They have eliminated all sweets from the program due to concerns about obesity
- They have prohibited the sale of soft drinks and chips/chocolate bars
- Some schools have even prohibited bringing these products to school from home

8. **Popular Restaurants**
- A Popular Restaurant in Brazil is designed to combat hunger
- There are several of these set up around the city
- They provide very affordable meals to whoever would like them
- People eat together, cafeteria style
- The meals are well-balanced using fresh, local foods
- The cost is R$1 (about $0.75 Canadian) for lunch

9. **Demonstration Farm**
- A working farm where local family farmers can go and learn about techniques that work in their semi-arid climate
- Uses the concept of "permaculture"—"perma" stands for permanent (i.e. sustainable)
- Learning environment is such that even non-literate farmers can learn
- Operates on several principles:
  a) Take care of the soil
  b) Respect life
  c) Be aware of over-consumption
  d) Set up the farm in zones
  e) Conserve energy
  f) Everything must have at least two uses

Food Sovereignty—'Hunger Zero' Case Study

Part A: The Hunger Zero Programs

While watching the PowerPoint slide show, complete the following chart describing each of the Hunger Zero programs.

Program	Description
Food Bank	
Farm to City Markets	
Craft Markets	
Family Farms	
Farmers' Markets	
Sacolão (Big Bag) Stores	
School Meals Program	
Popular Restaurants	
Demonstration Farm	

Food Sovereignty—'Hunger Zero' Case Study

Part B: Food Sovereignty

After watching the PowerPoint, complete the following chart to determine which (if any) Hunger Zero programs address each of the following food sovereignty rights. Then, answer the questions that follow.

Right	Hunger Zero program that addresses this right
to prioritize local agriculture production in order to feed local people and not for export	
for peasants and landless people to access land, water, seeds and credit	
of farmers to produce food	
for consumers to be able to decide what they consume (+ culturally appropriate food), and choose how and by whom it was produced	
to protection from low priced food and food imports by having the right to impose taxes on excessively cheap imports	
to farm sustainably	
to the recognition of the role of women in agricultural production	
to participate in developing agricultural policies	

Source: UN—What is Food Sovereignty?

1. To what degree has the City of Belo Horizonte been successful in moving their population towards food security and sovereignty?

2. What does Canada do well in regards to food sovereignty and what could it improve on?

3. What lessons could Canadians learn from the Brazilian example?

What Canada is doing to meet its food security needs

Step 1

Work in a small group. You will become the expert on **one** of the organizations listed below.

Select an organization from the list below and research their work related to food security. Possible questions that you may wish to address include:

- What approaches are they taking to dealing with food security?
- Where are they working (country, urban)?
- Who are they serving?
- Are they using a sustainable approach?
- Are they government, non-government or a mix?
- What needs are they meeting?
- Other important tasks, information?

Ontario Association of Food Banks	*www.oafb.ca/*
Canadian Feed the Children	*www.canadianfeedthechildren.org*
Canadian Hunger Foundation	*www.chfpartners.ca*
Share Agricultural Foundation	*http://shareagfoundation.org*
Menu of Choices	*http://www.menuofchoices.ca/*
FoodShare	*http://www.foodshare.net/*
Toronto Community Garden Network	*http://www.tcgn.ca/wiki/wiki.php*
STOP	*http://www.thestop.org/*

Step 2

Share the information that you have collected with your group.

Step 3

In your group review the Hunger Zero programs and food sovereignty rights.

Step 4

You sit on a committee that has been asked to develop programs to address food sovereignty in your local community. As an organization, make recommendations as to what kinds of programs you feel need to be implemented, who should implement them and how will they be implemented. Consider location, population, and the principles of Hunger Zero and rights of food sovereignty in your final decision

Step 5

Each group is to share their recommendations with the class and then the class will work to reach a consensus on what programs would be most effective for your local community.

Common Threads IV—Hunger Zero

Brazil's Location

Belo Horizonte and Araçuai are the two communities in Brazil that were studied in order to learn about how they have implemented Hunger Zero programs.

Common Threads IV—Hunger Zero

Common Threads IV—Hunger Zero

Hunger Zero General Principles

- Food is a basic human right
- Use fresh, healthy foods
- Use locally made produce
- Remove the stigma from using these programs
- Make the programs available to all
- Make people self-sufficient, not dependent

Common Threads IV—Hunger Zero

1. Food Bank

- Unlike Canada, Brazil's Food Banks cater to institutions, not individuals (e.g. orphanages, programs for young mothers, community centres, etc.)
- Based entirely on donations
- Dept. of Sanitation collects potential food waste from grocery stores and brings it to the Food Bank for sorting
- Mostly fresh fruits and vegetables

Common Threads IV—Hunger Zero

1. Food Bank

Common Threads IV—Hunger Zero

2. Farm to City Markets

- Located in key neighbourhoods
- Organized by the municipality
- Each farmer has two days/week
- Mostly fruits, vegetables and baked goods
- Eliminates the “middle man”
- Like a very small-scale farmer’s market

Common Threads IV—Hunger Zero

2. Farm to City Markets

Common Threads IV—Hunger Zero

3. Craft Markets

- Set up in government buildings (e.g. Tax Centres, Social Service Centres, etc.)
- These are places with un-used spaces (e.g. lobbies) where many people come on a daily basis
- Products include crafts, sweets & clothing
- Eliminates the “middle man”

Common Threads IV—Hunger Zero

3. Craft Markets

Common Threads IV—Hunger Zero

4. Family Farms

- This is a government program
- Landless families are able to claim land that is not being worked by the owners
- This brings more land into production
- The landless people are able to work the land and eventually purchase the property
- These family farms provide food for the Farm to City markets and Craft markets

Common Threads IV—Hunger Zero

4. Family Farms

Common Threads IV—Hunger Zero

5. Farmers Markets

- Operate usually on Sundays
- Local farmers come and bring fruits, vegetables and animals/meats to sell
- Food is fresh and cheaper than at supermarkets
- Provides a market for the smaller-scale farmers
- In addition, crafts, baked goods and clothing are sold

Common Threads IV—Hunger Zero

5. Farmers Markets

Common Threads IV—Hunger Zero

6. Sacolo (Big Bag) Stores

- These are grocery stores around the city
- 20 items are designated “Sacolão” items and their price is set at R$0.69/kg (about $0.52 Canadian)
- These items change throughout the year, depending on what’s in season
- Other fruits and vegetables are also priced more cheaply than at other stores
- This encourages healthy eating of seasonal products from local farmers

Common Threads IV—Hunger Zero

6. Sacolo (Big Bag) Stores

Common Threads IV—Hunger Zero

7. School Meals Program

- Lunch is provided to every student in the country
- They try to use fresh, not processed, foods
- Schools use foods grown in their own gardens
- They have eliminated all sweets from the program due to concerns about obesity
- They have prohibited the sale of soft drinks and chips/chocolate bars
- Some schools have even prohibited bringing these products to school from home

Common Threads IV—Hunger Zero

7. School Meals Program

Common Threads IV—Hunger Zero

8. Popular Restaurants

- A Popular Restaurant in Brazil is designed to combat hunger
- There are several of these set up around the city
- They provide very affordable meals to whoever would like them
- People eat together, cafeteria style
- The meals are well-balanced using fresh, local foods
- The cost is R$1 (about $0.75 Canadian) for lunch

Common Threads IV—Hunger Zero

8. Popular Restaurants

Common Threads IV—Hunger Zero

9. Demonstration Farm

- A working farm where local family farmers can go and learn about techniques that work in their semi-arid climate
- Uses the concept of "permaculture"—"perma" stands for permanent (i.e. sustainable)
- Learning environment is such that even non-literate farmers can learn

Common Threads IV—Hunger Zero

9. Demonstration Farm

- Operates on several principles:

1. Take care of the soil
2. Respect life
3. Be aware of over-consumption
4. Set up the farm in zones
5. Conserve energy
6. Everything must have at least two uses

Common Threads IV—Hunger Zero

Demonstration Farm

Composting toilets are used to provide fertilizer for the farm.

Common Threads IV—Hunger Zero

Demonstration Farm

Crops are planted in semi-circles to make it easier to irrigate. Left-over materials are used to build up the beds.

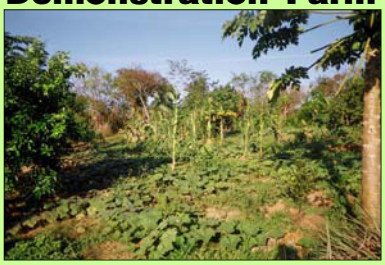
Common Threads IV—Hunger Zero

Demonstration Farm

Drip irrigation is used to target specific areas. A living fence is being grown to block the wind and prevent erosion.

Common Threads IV—Hunger Zero

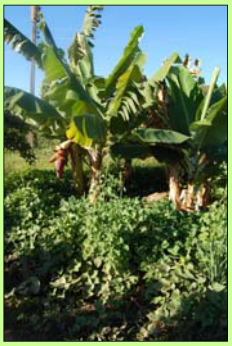
Demonstration Farm



Some crops are planted together for mutual benefit. Here are the "three sisters"—beans fix nitrogen and add nutrients, squash provides shade and humidity for the ground and corn provides climbers for the beans.

Common Threads IV—Hunger Zero

Demonstration Farm



Bananas are planted in a circle. The centre is used for compost. Sweet potatoes are planted in the shelter around the base of the banana plants.

Common Threads IV—Hunger Zero

Demonstration Farm

They filter "gray water" to re-use on the farm.

Common Threads IV—Hunger Zero

Demonstration Farm

A "greenhouse" is built with black perforated cloth hung over an A-frame. During the rainy season, the perforations let the rain through, without crushing the plants. The black cloth blocks out the strong rays of the sun.

Common Threads IV—Hunger Zero

Demonstration Farm
In Practice!

At an indigenous village. Semi-circles for crops made with available materials.

Common Threads IV—Hunger Zero

Overall expectations

- Define policy and why policy is necessary
- Explain viewpoints and personal significance of food policy

Enduring understandings

- Students will understand the importance of creating policy.
- Students will learn that policies can be created at different levels: personal, organizational (internal), and public.
- Students will recognize that public food policy is essential to addressing grand issues of food security, hunger and poverty, but that personal food policy is just as important, though it may differ between individuals.

Teaching and Learning Strategies

- Ask the class to brainstorm: What is policy? Why do we need policy?
- Food policy happens on various levels—personal, organizational, public.
- Ask students, how can Canada benefit from creating public food policy?

1. Students read BLM 5D-1, What is policy? Good definitions are also provided on this BLM.
2. Class discussion: What types of policies are they aware of that impact on the foods that they or their friends and families consume? The student suggestions can be written on the board. Ask the students to organize the suggestions on the board into 3 different categories. Discuss the various classifications with the students, leading to the final classifications of personal (actions that fit one's personal reality, such as vegetarian, low fat, etc.), organizational (religious or cultural customs, etc.) and public (food banks, farmer's markets, food guides, etc.)
3. What can be done when there is a clear desire and mandate to deliver a public food policy? Students read BLM 5D-2—Belo Horizonte. What has the municipal government done to ensure food security for its citizens? Why has this happened in Belo Horizonte and not in many other regions or countries? What are some key differences between Ontario and Belo Horizonte regarding the viewpoint of people toward food and food security?

   Assignment: Students write a 500-word response that answers the following questions: What policy is present in Ontario? What could be done to ensure food security for all? Why is public policy needed in addition to one's personal policy?

What is policy?

The word policy is often frightening to people. Sometimes this is because we don't understand policy.

What does policy mean?

In short, policies simply guide our actions. Policies can be guidelines, rules, regulations, laws, principles, or directions. They say what is to be done, who is to do it, how it is to be done and for (or to) whom it is to be done. Most of us think that we have no control over policies and that they are issues our elected officials and bureaucrats deal with. Well, this is not true. The world is full of policies—for example, families make policies like "No TV until homework is done". Agencies and organizations make policies that guide the way they operate. Stores have return policies. Workplaces have policies about things like sick days. Schools have policies that describe the way they expect children to behave.

Policy occurs at various levels and points of interaction—personal, organizational, and public.

If we use the right strategies we can be successful in influencing all aspects of policy.

The following section will help to clear up some of the questions you may have about policies and will hopefully allow you to see the many different ways you can be involved with changing policies to increase food security in your community.

A Policy is... A guide for action

What policies do ...

- Outline rules
- Provide principles that guide actions
- Set roles and responsibilities
- Reflect values and beliefs
- State an intention to do something

Adapted from "Rural Communities Impacting Policy—A Workbook" , 2005

Why a policy may have to be developed or changed:

- Basic needs are not being met
- People have been treated unfairly
- Current policies or laws are not enforced or effective
- Proposed changes in policies and laws would be harmful
- Existing or emerging conditions pose a threat to public health,
- safety, education or well-being

Adapted from Health Communication Unit of the Centre for Health Promotion, University of Toronto, 2004

Personal policy

Personal policy is the set of standards you use to guide your own decisions and actions. Despite our best efforts, economic realities can sometimes make it difficult to carry out personal policies. For example, you may want to buy from local stores, but Wal-Mart is the only store you can get to without a car.

One theme that came out of our story-sharing workshops in Nova Scotia reflects a personal policy (and economic reality) of many families—first pay the bills to ensure transportation to work, a roof over their heads, and heat in their homes, then worry about food. It has often been found that although food is necessary for survival, the money for food is the most flexible portion of a family's budget and so is the part that gets cut to meet other needs.

While some people are able to make the choice to buy local foods or organic foods, unfortunately not everyone can. It is important to recognize and be sensitive to this when talking about personal policy. Focusing on individual choice may not be the best approach to take when addressing some food security issues. Alternative strategies aimed at reducing inequities within society and systems that enable full participation are needed in order for everyone to exercise their own personal policies.

Organizational policy

Organizational policy guides how organizations and businesses operate. Unlike public policy, which often has opportunities for public input, organizational policies are often made out of public view. The internal policies of a surprising number of businesses and organizations can have an impact on food security—for example, supermarkets, food banks, food processors,

What is policy?

trucking companies, and land developers. The following examples show how organizational policy can affect food security.

Organizational Policy in Action (1)

Oxford Regional High School in Nova Scotia has instituted the Cumberland County School Food Project to provide healthy, fresh, local foods in the school. The program is designed to increase access to healthy foods for the students, and build and support a local food system—thus moving toward a healthier community and local economic development.

Cumberland County School Food Project, 2003

Organizational Policy in Action (2)

The Ontario Association of Food Banks developed a program to salvage potentially wasted food. The food is made into soup by "chefs in training"—19 former street youth interested in developing cooking and job skills. The soups are frozen and trucked to food banks across Ontario.

Ontario Association of Food Banks, 2003

Public policy

All levels of government—federal, provincial, and municipal—create policies to address specific issues or problems. These public policies are developed through a process that involves input from citizens, government staff, and elected officials.

Have Your Say

Until recently, policy has been a "top-down" process where decisions are made at the top, passed down to the organizations or groups responsible for implementing the policy, and finally reach the people who are affected by the policy. Within this traditional approach to policy development, citizens' involvement has been limited to elections, referenda, speaking out at legislative hearings, surveys and polls, advocacy, and town hall meetings. Recently, however, the federal and provincial governments in Canada have signed the Social Union Framework Agreement (SUFA), a commitment to working more collaboratively with individuals, families, communities, voluntary organizations, business and labour to develop public policy. SUFA requires that citizens be engaged in setting priorities and directions, decision making, and reviewing and evaluating the results and impacts of policy. SUFA gives us all the opportunity—as individuals and communities—to influence the policy development process and to take part in creating good public policy to address the issues that impact on our lives, our communities and everyone's food security.

For more information on SUFA please visit: www.tbs-sct.gc.ca/rma/account/sufa-ecus–e.asp

As the examples below show, public policy can have a profound impact on people's lives. Sometimes this impact is positive, other times it may be negative. The two examples below show that public policy can have both positive and negative impacts on food security.

Public Policy in Action (1)

In Nova Scotia, parents who were on income assistance got the child tax benefit, a combination of benefits from federal and provincial programs. At the same time the provincial government eliminated the income assistance allowance (family allowance) for children. In the end, the tax benefit intended to help families with children offers very little additional help to parents on income assistance.

Public Policy in Action (2)

The provincial government in New Brunswick decided to allow parents on income assistance to receive the usual income assistance allowances for themselves and their children AND receive their child tax benefits from the federal and provincial governments. A study that looked at food insecurity among low-income lone mothers in Atlantic Canada found that mothers in New Brunswick were the least likely to experience food insecurity. The mothers who participated in Nova Scotia were three times more likely to experience food insecurity.

McIntyre et al, 2002

What is policy?

Policy tools

Once a policy has been decided upon, many different methods can be used to implement it. These are sometimes called policy tools and include: information, education, legislation, regulation, guidelines, standards, procedures, programs, grants, subsidies, expenditures, taxes, and/or public ownership.

The following example shows the way policy tools could be used to implement a policy on land use. Note that this example is an illustration and not an actual policy.

Example: Green Space for Community Gardens

An urban municipality has developed a policy to increase green space for urban food production in order to encourage community gardens that increase food self-reliance, improve fitness, contribute to a cleaner environment, and enhance community development.

Possible policy tools

Information An information package on organizing, operating and sustaining community gardens will be developed and made available for distribution to community groups, housing associations and developments, non-profit organizations, businesses, and public sector offices throughout the city.

Education Public health educators and city planners will be engaged to work collaboratively to design an educational program on the benefits of preserving green space for food production targeted at private landowners, including developers, business operators, and home owners.

Legislation A minimum of 25% of current public green space will be available for urban food production within each voting district of the municipality.

Regulation The development of unused or vacant land, or the redevelopment of land for public purposes will be required to maintain a certain percentage of that land for green space, and a minimum of 25% of the green space will be available for urban food production.

Guidelines Guidelines will be developed for proper and sustainable urban food production practices and will be mandated for all public green space used or converted to a community garden or other urban food production purpose.

Standards Future land development in the municipality will consider a minimal standard of designated green space. All development and redevelopment should abide by this policy.

Procedures Standard procedures will be established for starting a community garden on public green space.

Programs Programs will be implemented through the combined efforts of the Departments of Public Health and Urban Planning within public institutions, including schools, libraries, municipal offices, and hospitals, to start and maintain public gardens with the support of the staff and interested citizens of those institutions.

Grants The "Community Garden Development Grant" will be established to provide one-time start-up grants to community groups committed to starting community gardens.

Subsidies Wage subsidies will be made available for supporting a paid staff position for established (3 or more years in operation) community gardens of 100 or more plots.

Expenditures A minimum of one new municipal position will be created for a Green Space Coordinator who will oversee the implementation of this policy.

Taxes Property taxes will be increased where private land development or redevelopment does not comply with the regulations of this policy. (Note this does not apply to current private land unless it is being redeveloped).

Public Ownership Public green space converted for

What is policy?

use in urban food production by community groups will thereafter be considered under shared public ownership between the municipality and the community group; future decision-making regarding the space will be done so collaboratively.

Not all policies require this many policy tools for implementation! Depending on the kind of policy being considered and the level at which it is implemented, you may need only a few.

Belo Horizonte

The Beautiful Horizon of Community Food Sovereignty

Wednesday 9 July 2008 by
Wayne Roberts, Cecilia Rocha

The concept of food sovereignty is the right of peoples to define their own alimentary and agricultural policies, to protect and regulate their production and trade in such a manner as to obtain sustainable development, to determine the degree of their autonomy and to eliminate dumping on their markets.

A growing number of citizens, civil society organizations, and economic, environmental and social leaders around the world, including in Quebec, have already converted to the concept of food sovereignty. Last September, in Montreal, a declaration was adopted by 45 concerned organizations at the first Quebecois conference for food sovereignty, jointly organized by the G05, the Coop Fédérée and Équiterre.

As worldwide interest in food sovereignty and food security continues to grow, the city of Belo Horizonte, Brazil is enhancing community food sovereignty programs that address health, social equality, job creation, diversified agriculture and the encouragement of local food production.

The center of action for Belo Horizonte's food programs is the SMAAB, the Secretaria Municipal de Abastecimento or the Municipal Secretariat of Supplies. Food activists in the industrialized world are just beginning to understand that working effectively on food issues means working on—and reforming—the logistics and supply chain of the food system. The government of Belo Horizonte understood that back in 1993 when Partido dos Trabalhadores or Workers' Party was elected and subsequently acknowledged both citizens' rights to "adequate quantity and quality of food" and "the duty of governments to guarantee this right." The government recognizes that food is a guaranteed right that is necessary for citizenship and health, and, therefore, manages the provision and distribution of food. Efforts are also made to engage community groups as partners of the government, thereby reaffirming the open, inclusive and democratic character of program offerings.

Belo Horizonte's programs are forward thinking; the World Trade Organization legitimizes government interventions in the economy that provide food as long as they are classified as anti-poverty programs. This is a core principle of what Dr. Flavio Valente, a volunteer rapporteur from Brazil for the United Nations office on human rights, calls "the Washington consensus," precisely because it leaves human rights and food security systems—the right to have basic information about whether food has been genetically-engineered, for example, or the need to ensure adequate fresh fruit and vegetable production for local populations—out of the equation.

The concerns raised by Valente are top-of-the-list issues in Belo Horizonte and throughout Brazil as a whole. There is a profound tradition behind these concerns in Brazil, where the Zero Hunger program can be traced to food system campaigns by popular heroes such as Josuée de Castro and Herbert de Sousa, both of whom identified food as a fundamental human right needed for health and social inclusion. Promi-

Belo Horizonte

nent among today's Zero Hunger leaders is Patrus Ananias, the former Workers' Party mayor of Belo Horizonte when its dynamic food programs were launched. He would later become national Minister for Social Development and Hunger Alleviation responsible for the Zero Hunger strategy under the Lula government.

Belo Horizonte's food initiatives began with a first line of action targeted to vulnerable groups at risk of malnutrition. One program from the early days provided a nutrient-rich flour—made up of locally-produced ingredients—for the at-risk population. Another program, launched more recently, provides unsold or donated surplus, as is common in charitable "food banks" of the North. A third set of initiatives focuses on healthy meals in childcare centres and elementary schools.

Belo Horizonte's second line of action deals with interventions in the economy to help businesses respond to the food needs of people on low incomes, thereby avoiding such problems as "food deserts"—areas of a city that lack affordable and quality food retail outlets. Belo Horizonte's three "popular restaurants", each in a different area of the city, are a case in point. A typical popular restaurant is over 1000 square meters in size and is open for lunch and dinner during the workweek. Meals are simple, frugal and nutritious. One standard, subsidized rate is charged to all. Customers range from workers, students, street youth, to street vendors and seniors. Regular customers can join an organization to suggest or advocate for meal improvements. Other initiatives make healthy basic foods available to people in low-income communities, for example, a "popular food basket" that people in many countries have tried to emulate (such as the Bonne boîte Bonne bouffe initiative in Montreal). With a very modest government subsidy, the popular basket provides about 20 food and consumer necessities a week to consumers on low incomes, using economies of scale—that develop from serving over 4000 families—to keep prices down.

A third line of action actively encourages local food production of fruits and vegetables by small and low-income farmers. This is a four-way win for food sovereignty. It raises the incomes of small farmers close to the city, thereby achieving a major anti-poverty objective that helps more people buy the food they need. Secondly, it helps small, local farmers stay on their land instead of migrating to the overcrowded city where unemployment and poverty are rife. Thirdly, it increases the availability of fresh and health-promoting foods for all, since large farms in Brazil are typically dedicated to exports of sugar and oilseeds, not fruits and vegetables for local consumers. Fourth, by increasing the supply of produce, the price is kept stable.

Fruits and vegetables, the foundations of a healthy diet, have been neglected by large-scale farmers in Brazil, a country where one per cent of rural properties occupy 45 per cent of agricultural land, and where plantation-based and export-oriented agriculture is dominant. To make fresh and nutritious food available, the city government pro-actively encourages fruit and vegetable production in the food economy. SMAAB has also established a central farmers market of 10,000 square meters that moves 40,000 tons of produce a year. More than 45 Country General Stores, and at least one organic market, have been set up to move local produce. The city, as a purchaser, also orders local produce for popular restaurants serving about 5000 meals a day and for schools serving over 150,000 meals a day. As a result of all the businesses and alternatives stimulated by government programs, Belo Horizonte is the only Brazilian city where alternatives outperform commercial supermarkets in the sale of fresh fruits and vegetables.

With all of these initiatives, it is clear that Belo Horizonte is on the horizon of food sovereignty, taking the narrower concept of food security further than simply providing adequate nutrition for its population. Cities of the North have much to learn from these innovative lines of action.

Wayne Roberts is the coordinator of Toronto Food Policy Council and Cecilia Rocha is the director of Ryerson University Centre for Studies in Food Security.

Food. It is something we eat, everyday, in a variety of different forms purchased from a variety of different places.

If you think about it, food is something that we can't do without. It gives us energy and vital nutrients that we need to stay healthy and active. Actually, along with water and air, food is one of the basics of life.

But, have you ever thought about that food. I mean, have you ever wondered where it comes from, what it is made of, how it is produced, or even if everyone has enough food to eat.

We all know that there are places in the world where people don't get enough to eat. We have seen images of starving children and chances are at some point or another you have been involved in fundraising for famine relief or maybe even sponsoring a child or a family in a developing country. But lack of food isn't an issue in Canada, right?

And what about the safety of our food. With the recent problems surrounding mad cow disease, E.coli and Listerosis, many of us are starting to wonder where our food comes from, how it is produced and why has something as simple as eating a piece of lunch meat, could possibly kill us.

Lots of questions. Lots of information, and lots to think about. So let's begin, at the point where many of us interact commonly with food, the isle of our supermarket.

OSSTF/FEESO COMMON THREADS IV FOOD & FOOD SECURITY

Scene—Supermarket isle, cart being wheeled along with Trent in the front looking around. As images of produce etc. Pass by, a narrator voiceover:

To begin the journey of our quest to understand the issue of food security, we first must understand what it is that we are putting into our bodies. These days in Canada anyway, most of our food is delivered from the shelves of a convenience store or a supermarket. Initially, it seems that there is an endless variety of food and food choices, but in reality, most of the food is made surprisingly similar ingredients.

In fact, pick up almost any chocolate bar, cookie, can of pop or bag of chips contains at least one ingredient that is derived from corn along with a whole list of ingredients with a variety of different purposes and sourced from endless number of places.

1st Course. What's in your food?

Do we even know what these things are or where they come from (name several of the most unusual names of some of the ingredients). So you have to wonder, if we don't know what it is or where it comes from, should we be eating it? In fact, the food that most of us eat is now full of additives, preservatives and artificial colours and sweeteners. We have come to demand food that is uniform in appearance and above all else, cheap.

Unfortunately, in order to do this, food needs to be shipped from long distances, stored for long periods of time and formulated from cheap ingredients. Many of which such as glucose and fructose are derived from corn. Yet, it isn't likely that these ingredients are local as a so many of the things that we eat come from other countries sometimes oceans away.

2nd Course. Where does your food come from?

The next time you walk down the isle of your local supermarket, have a look at where the food that you see comes from. (clips of produce labels that show different country names) What you will probably find is a virtual geography lesson with fruit, vegetables, canned goods, seafood and other products shipped from around the world into your community. Most processed foods will originate from one central location and that location is usually hundreds of miles away from where you live.(side panels of boxes showing factory locations)

Indeed, people today have little connection with the food that they eat and increasingly the process of producing food is being dominated by large multinational companies that have created an industrialized food supply.(pictures of feed lots, chicken coops and vast fields of corn or grain)

Because our food is still relatively cheap, farmers in Canada have been forced to grow larger and larger crops and invest heavily in fertilizers and machines while still barely making a living. (Cameron farm interview about cheap food)

Yes, that is right. Despite high costs of oil, Canadians still enjoy food that is relatively cheap compared to the rest of the world and thus force supermarkets to look outside of the country for products that are made under less stringent environmental standards and with much poorer working conditions. For Canadian farmers, the need to produce high yields often results in mega farms that are largely monocultures, meaning they only grow one kind of crop. After a few years, the soil has lost the ability to replace the minerals and nutrients needed to produce food crops and thus needs massive amounts of added fertilizers and compost, all at a cost to the farmer and to the detriment of the land itself.

But this way of farming is a relatively new phenomenon. Past generations of farmers understood the importance of a process called permaculture, a simple process whereby different crops are rotated along with the influx of grazing of farm animals and the addition of manure and other compost from the farm for a more local and sustainable land management system.

This old way of doing things is being embraced in countries like Brazil where years of inappropriate use of marginal solid resulted in the creation of large tracts of relatively useless land. More and more, farmers are returning and reclaiming land and by using permaculture and water conservation methods on the farms, they are leading a charge to change the way that food is produced. The government is supporting these initiatives by creating space for local products to be sold and providing a stable market for some of the produce thus guaranteeing a liveable income.

Unfortunately, in Canada, this trend is not yet evident and the face of farming continues to change from the way it was even decade's earlier (Cameron interview about how farming has changed)

But, in Canada we still seem to enjoy an abundance of food choices and for most of us, the idea of hunger seems like a problem experienced by other countries. But, when if you start to talk about access to healthy food, the reality for Canadians and for the rest of the world is quite different and leads to more questions about the issue of food security.

3rd Course. The politics of hunger

It is becoming more and more apparent that the quantity of food that is available is only one part of the puzzle. It isn't just about having the food, it is making sure that the food is healthy and nutritious and grown in a sustainable way.

We all are aware of famine and starvation throughout the world but many people would be surprised to learn that over 20% of the people in Canada live in poverty and x number of people have relied on food banks at least once in the last year. Providing food for people is a challenge that is faced in different degrees by almost every country on earth. While some countries don't have the resources or the political will to even try and address the food security issue of their citizens, others use food banks for school breakfast and lunch programs to alleviate the problem.

However, this can sometime lead to inadequate dispersal of food and an overreliance on less nutritious convenient foods while often stigmatizing those that rely on these type of programs. But what alternatives are there.

One city in Brazil has experimented with subsidized public restaurants, low cost government supported supermarkets and locally grown and culturally appropriate school food programs as a way of addressing hunger while ensuring the food is safe and nutritious. But could this work in Canada? And why does it matter what type of food we eat and why does it matter if the food is locally produced.

It is also interesting to note that Brazil is known not just for some of its innovative ideas to produce food for people, it is also the worlds largest maker of fuel that is derived from food. This fuel is known as ethanol and is being touted around the world as a possible alternative to oil to fuel our cars, homes and businesses.

4th Course. **Fuel from food—the ethanol debate**

With supplies of oil rapidly depleting and the instability or remoteness of current supplies of the fossil fuel, ethanol, a fuel derived from a variety of sources including corn is becoming a popular alternative. (pictures of gas stations, the Middle East in war and the Alaska wildlife refuge followed by fields of corn.)

Ethanol can be used as an alternative to gas or combined with gas in different amounts allowing us to stretch out the current supply of available fuel. (picture of pumps with ethanol blends and pictures from Brazil of the signs outside the gas station advertising ethanol). But the problem with using corn to produce ethanol is the amount of energy needed to create the fuel can often be more than the amount of energy you need to actually make the fuel in the first place. In addition, some question the ethics behind using food to make fuel for some countries while other countries still struggle with famine. However, for the Canadian farmer there are benefits to developing an ethanol industry (Doug Cameron interview)

Yet, it is important to note that corn is only one way to produce ethanol. Wood cellulose, hemp, switch grass and sugar cane can also be used and some countries have embraced the ethanol alternative but used crops that are easier to grow, require less energy and can be grown on marginal land, reducing the energy input while still producing fuel grade ethanol (lots of shots from the sugar cane farm and the interview with the German guy in Brazil)

The other unintended consequence of using food for fuel brings us back to the grocery store and our realizations that so many of the products we use rely on corn. If there is less available because of diversion to fuel, than the costs of food may increase. And when you consider that so many people already struggle to find have enough to eat, this is not a very "palatable" option. (more shots from the grocery store)

But the irony is that, at the same time that Canadian and American kids struggle with obesity from overeating, many people in these countries and around the whole world continue to starve or suffer from malnourishment and hunger. (pictures of famine and people at soup kitchens compared with some pictures of people and big guts)

It would seem that there is enough food to go around but then what stops us from getting the food to the people who need it. More and more people are beginning to argue that access to safe, healthy and nutritious food should be a basic human right. Some countries have decided to eliminate hunger by simply ensuring that everyone has enough to eat and that the food available is healthy and grown by local farmers. But isn't that cost a lot of money?

5th Course. **The future of food**

So, now that we understand some of the challenges, what can we do to ensure food security for the future?

As we have already mentioned, it is time to start looking at the way that we produce food. With the increasing popularity of the organic food movement and an increasing emphasis towards locally grown food, we can start influencing the process by which we get our food and produce it in a way that is sustainable and healthy.

Some farmers have started to work with permaculture and other more sustainable and ecologically friendly practices, opting for smaller scale and mixed farmer instead of large one crop monocultures. Others have started to grow food organically and accessed local markets rather than supply large agri-business. However, even organic food can be complicated with a wide range of standards and providers with the overall environmental benefits sometimes being questioned.

Yet, a growing course of consumers, farmers and retailers have started to question the current way of producing the food that we eat. But, at the same time, fewer young people in North American anyway are interested in farming while the farmers themselves continue to struggle to survive.

Conclusion

So, the next time you are in a supermarket moving down the isles, take a second to look at the food that

surrounds you. Find out where it comes from and take some time to consider how it is made and who made it.

When you consider how important food is to our overall wellbeing, maybe it is time that we spent a little more time thinking about it and what the future of that food will be.

After all, when you consider how important it is that we have access to safe, healthy and nutritious food, maybe we should view our trips to the grocery store through more critical eyes.

Our life may depend on it.

Credits and music

1. What percentage of Canadians live below the poverty line?

2. What is food security?

3. In the opinion of Thomas Pawlick, why has our system of producing food started to fail?

4. What kind of food related illnesses have you heard about recently?

5. What types of ingredients are commonly found in processed foods?

6. What grain can be found in a variety of different forms in most processed food?

7. Name some of the expectations of the average consumer when they purchase food in Canada?

8. How has farming changed in recent decades?

9a. _____ is a way of farming that uses techniques such as crop rotation and a variety of crops to ensure that the soil remains healthy and full of nutrients.

9b. How does it ensure that the land will remain healthy?

10. In what ways has the Brazilian government in Belo Horizonte ensured healthy and affordable food for its citizens?

11. List three things that should be included in a successful food program.

12. What is ethanol made from? What are the possible drawbacks of using corn to produce fuel?

13. What other materials can be used to make ethanol?

14. What can you do to ensure healthy and nutritious food and a healthy environment for the future?

Class Discussion Rubric

Criteria	Level 1 50-59%	Level 2 60-69%	Level 3 70-79%	Level 4 80-89%
Quality of Comments	• Struggles but participates; occasionally offers a comment when directly questioned • Simply restates questions or points previously raised; adds nothing new to the discussion	• Volunteers comments but lacks depth • May or may not lead to other questions from students	• Volunteers comments, most are appropriate and reflect some thoughtfulness • Leads to other questions or remarks from student and/or others	• Appropriate and thoughtful comments; responds respectfully to other student's remarks • Provokes questions and comments from the group
Lesson Content/Reference	• Does not understand the content and cannot sustain any reference to it in the course of discussion	• Has understood the content; lacks thoroughness of understanding or insight	• Has understood the content with some thoroughness, may lack some detail or critical insight	• Clear reference to content, connects to other reference points from previous readings and discussions
Active Listening	• Drifts in and out of discussion, listening to some remarks while clearly missing or ignoring others	• Listens to others some of the time, does not stay focused on other's comments • Shows some consistency in responding to the comments of others	• Listens to others most of the time, occasionally does not stay focused on other's comments • Shows consistency in responding to the comments of others	• Posture, demeanour and behaviour clearly and consistently demonstrates respect and attentiveness to others

Writing Discussion Rubric

Criteria	Level 1 50-59%	Level 2 60-69%	Level 3 70-79%	Level 4 80-89%
Introduction	• Not successful in capturing readers attention • Text lacks sincerity • Little or no evidence of tone	• Not very successful in capturing and maintaining readers attention • Text not very convincing and sincere • Minimal tone	• Fairly successful in capturing readers attention • Text is convincing and sincere • Tone is generally effective i.e. creates mood	• Successful in capturing and maintaining readers attention • Text consistently convincing and sincere • Tone consistently effective i.e. creates mood
Focus	• Minimal logical plan and sequence; interferes with comprehension • No clear introduction and/ or conclusion • Transitions are omitted • Paragraphs: no evidence	• Overall logical plan and sequence present but weak • Introduction and/ or conclusion weak • Transitions are not always used • Paragraphs are sparse	• Adequate overall logical plan and sequence • Introduction and conclusion are adequate and related • Transitions are used where needed • Paragraphs may not appear throughout text	• Very good overall logical plan and sequence • Introduction and conclusion are strong and effective • Transitions are used appropriately and skilfully • Paragraphs are appropriate
Organization	• Unclear main idea/purpose • Text wanders • Simplistic • Inaccuracies in information	• Main idea/purpose recognizable • Focus somewhat flawed • Predictable • Supporting details repetitive, unrelated	• Main idea/purpose reasonable clear • Text shows focus, some lapse • Fairly interesting • Supporting details fairly accurate	• Very clear main idea/purpose • Text focused • Interesting, original, insightful • Supporting details accurate
Speech	• Weak command of grade appropriate conventions • Grammar and spelling used with limited accuracy and effectiveness	• Fair command of grade appropriate conventions • Grammar and spelling used with some accuracy and effectiveness	• Good command of grade appropriate conventions • Grammar and spelling used with considerable accuracy and effectiveness	• Excellent command of grade appropriate conventions • Grammar and spelling used with a high degree of accuracy and effectiveness-(no errors)
EffectiVisual Aid(s)e use of language	• Many lapses in fluency • No variation in sentence length • Word choice is limited • Figurative language rarely used	• Lapses in fluency • Little variation in sentence length • Word choice somewhat limited • Figurative language occasionally used	• Fairly fluent, smooth and natural • Some sentences vary in length • Word choice is generally appropriate • Figurative language used fairly successfully	• Fluent, smooth and natural • Sentences vary in length • Word choice is appropriate • Figurative language used successfully

Oral Presentation Rubric

Criteria	Level 1 50-59%	Level 2 60-69%	Level 3 70-79%	Level 4 80-89%
Introduction	Introduction is not engaging	• Introduction is minimally engaging	• Interesting introduction; engages audience	• Introduction captivates audience with interest and/or intrigue
Focus	• No clear focus	• Presentation lacks clear direction	• Topic of presentation is clear; content consistently supports the purpose	• Purpose of presentation is clear; supporting ideas maintain exceptional focus on the topic
Organization	• No clear organization of ideas present • There are no clear transitions between thoughts and ideas • No conclusion is evident	• Poorly developed organization of ideas; illogical sequence • Transitions between thoughts and ideas are inconsistent, weak or missing • Conclusion demonstrates an attempt to summarize main points	• Information/ideas are presented in a logical sequence with few lapses • Transitions between thoughts and ideas are adequately made • Conclusion somewhat effectively summarizes the main points	• Information/ideas are presented in a consistently logical sequence. • Transition between thoughts and ideas are effectively and consistently made • Conclusion effectively summarizes the main points
Speech	• Audience hears with great difficulty • Reads notes and seldom establishes eye contact	• Can be heard by most members of the audience. • Relies too heavily on notes and rarely establishes eye contact.	• Can be heard by all members of the audience • Minimal reliance on notes and generally maintains eye contact	• Can be easily heard by all members of audience • Commands audience attention through consistent use of eye contact • Uses visual aid as guide or outline for speaking but no notes used
EffectivVisual Aid(s)e use of language	• Visual aid(s) undecipherable • Graphic detracts from message; messy or inappropriate visual	• Visual aid(s) not completely accessible to all audience members • Graphic may be messy; may not be most appropriate to support presentation	• Visual aid readable from all parts of the room • Graphic is neat; appropriate subject chosen to depict message	• Visual aid readable and attractive from all parts of the room • Graphic is clear and professional looking, enhancing the message
Questions and Answers	• Could not answer questions and/or answers are irrelevant	• Response not clear and/or did not add to comprehension of the listener	• Thoughtful, concise response. Conveys knowledge of subject	• Speaker expands upon previous statements. Cites additional examples to answer question

Debate Panel Discussion Rubric

Criteria	Level 1 50-59%	Level 2 60-69%	Level 3 70-79%	Level 4 80-89%
Opening & Closing Statements	• Somewhat organized presentation of arguments and evidence • Opening statement minimally outlines arguments; closing argument briefly restates the ideas offered in opening statement	• Organized and generally complete presentation of arguments and evidence • Opening statement outlines or lists arguments and evidence but does not generate interest; closing statement does not reflect remarks made during debate.	• Well-organized & complete presentation of arguments and evidence • Opening statement successfully frames the issues; closing statement summarizes many arguments made in the debate	• Extremely thorough, well-organized presentation of arguments and evidence • Opening statement engages the interest of audience; closing statement leaves no unanswered issues and resonates with the audience
Rebuttals	• Seems to be caught off-guard by opponents; offers tentative, somewhat accurate, but possibly vague or illogical responses • Attempts to challenge arguments of opponents	• Responds to most of the issues raised by opponents with generally accurate answers • Offers arguments, but no evidence, to counter arguments made by opponents	• Responds to issues raised by opponents with accurate & generally concise answers • Challenges the arguments made by opponents; challenges are generally effective	• Responds to issues raised by opponents with concise, accurate, logical answers • Effectively challenges the arguments made by opponents with argument and evidence
Effective use of evidence/ content knowledge	• Demonstrates a generally accurate understanding of issues, events and facts, but may exhibit minor confusion or misunderstandings • Demonstrates limited ability to connect facts & concepts	• Demonstrates a basic and accurate understanding of the issues, events and facts relevant to the topic • Demonstrates the ability to make basic connections between facts and concepts	• Demonstrates a sophisticated understanding of the issues, events and facts relevant to the topic • Demonstrates solid understanding of details and ability to make original connections and interpretations	• Demonstrates a superior understanding of the issues, events and facts relevant to the topic • Demonstrates thorough and accurate understanding of details and consistently makesoriginal connections and interpretations
Use of persuasive appeals	• Makes minimal use of persuasive appeals	• Uses some appeals to make argument more persuasive, bu may not include a mix of logi emotional and ethical appeal	• Uses logical, emotional and ethical appeals to enhance effectiveness of argument	• Makes deliberate and effective use of logical, emotional and ethical appeals in order to persuade justices
Performance	• Lacks confidence • Use of preparation materials distracts from quality of performance	• Appears nervous, yet somewhat confident • Use of preparation materials does not distract from performance	• Exhibits confidence and energy • Uses preparation materials effectively	• Exhibits confidence, energy, and passion • Accesses preparation materials with ease

CHF Partners in Rural Development. (2008, August). Responding to the global food price crisis. Retrieved from http://www.chf-partners.ca/publications/publications.shtml

CHF is a non-profit organization helping to eradicate poverty in developing countries. The Organization's mission is to assist the rural poor to become self-sufficient by having access to water, land, energy, technology and other resources for sustainable and healthy living conditions. This report offers CHF's recommendations for responding to the crisis in three key areas: programming, policy, and public engagement.

Collier, Paul. (2007). The bottom billion: Why the poorest countries are failing and what can be done about it. New York: Oxford University Press.

Collier contends that the real crisis in global poverty lies in a group of about 50 failing countries. These "bottom billion", are countries whose problems defy traditional approaches to alleviating poverty. This group of small nations, largely unnoticed by the industrialized West, are dropping drastically behind the majority of the world's people, often falling into an utter decline in living standards. Collier analyzes attempts at reformation and its struggles, the causes of failure, and offers an innovative strategy to deal with the crisis of poverty.

Dietitians of Canada

An online source of reliable nutrition information and resources developed according to Canadian nutrition standards. Website includes links to labelling information and teaching resources, dietary analysis programs, and current nutrition information for all age groups. www.dietitians.ca

Grogg, Patricia. (2009, September 10). Farming in Cuba and climate change. Havana Times.
Retrieved from http://www.havanatimes.org/?p=13618

This article focuses on an innovative approach used in Cuba to bring scientific advances in the laboratory to the field. The Inivit Center has created a program where researchers travel to farms to teach and in turn, learn from farmers. Farmers have devised impressive ways to deal with extreme climatic conditions that Cuba must face including periods of prolonged drought and the hurricane season. Dialogue between researchers and farmers is an important step for increased and more reliable agricultural production.

Lappe, F. M., Collins, J. and Rosset, P. (1998). World hunger—twelve myths. New York: Grove Press.

Three of the leading experts on food and agriculture, from the world-renowned Institute for Food and Development Policy (Food First), have come together in this gripping resource that explores the myths of food production and delivery. Discussing and critiquing the policies and politics at play, preventing millions of people in both the developing and the developed worlds from being able to adequately meet their daily nutritional needs are at the forefront of this resource. This books attempts to illuminate the many myths surrounding food production and distribution as a means of finding a sustainable remedy to this enormous. It gives people the knowledge and power to band together to fight hunger throughout the world.

Miller, S. (2008). Edible action—food activism & alternative economics. Black Point, N.S.: Fernwood Publishing.

Our system for growing and delivering food is in a crisis situation. Productive farmland is degraded by the erosional powers of wind and water, local farms are being taken over by agribusiness because of increasing debt, the method of food dispersal is inadequate in feeding millions of people on a daily basis all the while, hunger is increasing, obesity is increasing and the amount of people afflicted by food-borne illness is increasing. Miller, an anthropologist and environmentalist with more than 20 years in the alternative food and agriculture sector, offers suggestions for change and alternatives to the conventional economics of food that will have lasting, positive economic, social and environmental outcomes.

Millstone, E. and Lang, T. (2008). The atlas of food: Who eats what, where, and why. Berkeley: University of California Press.

Through the use of maps, diagrams, simple statistics, bar graphs, and pie charts, Millstone and Lang provides a clear and comprehensible presentation of statistical data on where the food we eat comes from, who eats what, who produces it, and what that means for nutrition, the environment, and economics. The authors intend to demonstrate the effects of globalization and technological advance on food related activity. They also show how nations compare with one another on such diverse topics as disease, over- and under-nutrition, advertising, pesticide use, trade flows, staple foods, and fast food.

Nestle, M. (2007). Food politics: How the food industry influences nutrition and health. Berkeley: University of California Press.

Nestle exposes the politics of food and how this industry is the largest and most influential industry in developed nations. The amount and types of food eaten in North America are influenced by Food Guides and Food Pyramids published by the government. Nestle suggests that what has been viewed as a healthy, nutritious diet has not changes over time and that eating a diet rich in fresh fruits and vegetables is still advantageous. Unfortunately, ideology is in direct conflict with that of the food-production corporations which make large profits off of highly-processed foods. Nestle suggests that large agriculture industries play an important, profound and somewhat unsettling role in the creation of the ideas upon which we make our daily food choices.

Patel, Raj. (2007). Stuffed and starved: Markets, power and

the hidden battle for the world's food system. Toronto: HarperCollins Publishers Ltd.

In wealthy nations, we can eat pretty much whatever we want, regardless of the season, where in the world the food is produced or how much it costs. The waistlines of the rich are expanding. An ocean away, in lesser-developed nations, waistlines are also expanding, bloated from a lack of nutritious, sustainable food. These two scenarios are not as opposing as one might initially believe. It is important to understand where our food comes from and how our daily food choices have lasting and undeniably negative implications on those living in poverty. Patel closely examines the world's food system from commodities such as coffee and corn to the processed food served in fast food restaurants and found on grocery store shelves. This passionate book shows the struggles to feed the world while also suggesting more sustainable ways of bringing nutritious food to all.

Patel, Raj. (2009). Stuffed and starved: From farm to fork, the hidden battle for the world food system. Toronto: Harper Perennial Canada.

Patel explores the contrast between have and have not countries. The system that makes for our supermarkets being without season creates serious economic and environmental consequences around the world. Are we as consumers complicit?

Pawlick, T.F. (2007). The end of food: How the food industry is destroying our food supply, and what we can do about it. Vancouver: Greystone Books.

Pawlick is a journalist and a farmer in Eastern Ontario. This is a powerful critique of factory farming with many practical suggestions.

Pawlick, T.F. (2009). The war in the country: how the fight to save rural life will shape our future. Vancouver: Greystone Books.

Petrini, C. (2007). Slow food nation: A blueprint for changing the way we eat. New York: Rizzoli Ex Libris.

Petrini is the founder of the slow food movement. Time Magazine has named him a great innovator and a 'European Hero'.

Pollan, M. (2008). In defense of food : An eater's manifesto. New York: Penguin Press.

After reading this engrossing book, the simple question, "What's for dinner?" will not seem so simple. Pollan illustrates the many problems with our current, over-processed, Western diet that is mainly made up of 'edible foodlike substances'. He suggests that a 'back-to-basics' approach towards eating mainly fresh fruits and vegetables will not only reduce current chronic diseases and medical afflictions but also root us back to the family-friendly dining room table and bring pleasure back to eating.

Pollan, M. (2006). The omnivore's dilemma: A natural history of four meals. New York: Penguin Press.

Looking at how our food goes from the farm to our plate is a central theme in Pollan's expertly written resource on food. What he exposes from the corn growing in the field to the animal farm lots and finally to the production of your dinner is provocative if not disturbing but shows us the complacency in which we are choosing to feed ourselves. This thought-provoking book makes you take a long, hard look at food and what you eat, and will inevitably change the way you view what you put into your mouth.

Rennie, J. (Ed.). (2007). Diet, Health and the Food Supply [Special issue]. Scientific American, 297(3).

In this special single topic issue, the magazine explores the relation between human health and food. Among the articles included in this issue: Is Your Food Contaminated?, that suggests that innovative initiatives are necessary to safeguard the food supply; A Question of Sustenance asserts that though globalization has ushered in a world in which more than a billion are overfed, millions of people are in dire straits, suffering from a lack of food; Sowing a Gene Revolution reveals that one approach that has the potential to alleviate poverty and hunger is the approach called the "new green revolution" based on genetically enhanced crops.

Roberts, W. (2008). The no-nonsense guide to world food. Oxford: New Internationalist.

Out food comes to the dinner table through an intricately woven web of policies and practices of small rural farmers, agribusiness, corporations and governments. Roberts attempts to answer many questions about sources and production of, food sovereignty, food while also posing questions about the instability of our industrialized food systems as they are currently designed. Ultimately, he suggests actions needed to create a balanced, just and sustainable food system for all.

Schlosser, E. (2005). Fast food nation: The dark side of the all-American meal. Toronto: Harper Perennial. 2005.

Schlosser's groundbreaking expose of the fast food industry is just as relevant today. This is the bestseller that began the popular critiques of the food industry.
Shiva, V. (2000). Stolen harvest: The hijacking of the global food supply. Cambridge: South End Press.

Shiva, V. (1997). Biopiracy: The plunder of nature and knowledge. Cambridge: South End Press.

Shiva, a physicist, ecologist and activist, once again takes a historical look at the use and misuse of natural resources and species on our planet. Never shying away from ethical debates, Shiva discusses concerns and issues surrounding the manufacturing of new life in a Petri dish and what ethi-

cal, ecological and socioeconomic implications genetic engineering may ultimately have on biodiversity and the health of our global ecosystems.

Shiva, V. (2005). Earth democracy: Justice, sustainability and peace. Cambridge: South End Press.

Shiva, V. (Ed.). (2007). Manifesto on the future of food and seed. Cambridge: South End Press.

Shiva, V. (2008). Soil not oil: Environmental justice in an age of climate crisis. Cambridge: South End Press.

Shiva, V. (2002). Water wars: Privatization, pollution, and profit. Toronto: Between the Lines.

"One of the world's most prominent radical scientists."—The Guardian. Shiva is a prolific writer and champion of the environment, democracy and women's rights.

Vandana Shiva, a compassionate and leading environmental and social thinker of our time. Discussing genetically engineered foods, the globalization of our food supply, the impacts of corporate agriculture on small farmers and the ethical debate over companies owning patents on life, Shiva opens the Pandora's Box on what many consider to be the largest crisis facing humanity, the ability to sustainably feed ourselves.

Smith, A. and Mackinnon, J.B. (2007). The 100 mile diet: A year of eating locally. Toronto: Vintage Canada.

Smith's personal account is inspirational for anyone concerned about the production, transportation and environmental sustainability of their food. In developed nations such as ours, most people have lost their connection with food as we are able to obtain almost any food regardless of if it is in season or even able to be grown in our climate. Smith's suggests ways of looking at what you eat, and making informed decisions about where your food comes from. "Eating locally isn't just a fad—it may be one of the most important ways we save ourselves and our planet."—David Suzuki.

Steinmann, R. and Del Sol, N. (2008). A hungry world: Understanding the global food crisis. Mississauga, ON: World Vision Canada.

An educational resource in which students explore the global food crisis. They analyze some of the many causes and impacts of the problem, such as supply and demand issues, and consider the complex ways in which causes and impacts are interrelated. A Hungry World provides background information, statistics, case studies, classroom activities, and action ideas for teaching about global food insecurity

The Stop Community Food Centre. A recipe for innovation: The Stop's strategic plan 2006-2011.

The Stop works to increase access to food by providing frontline services to Toronto's communities, including a drop-in, food bank, civic engagement, community advocacy, sustainable food systems education and urban agriculture. The stop fosters "opportunities for community members to build mutual support networks, connect to resources and find their voices on the underlying causes of hunger and poverty." The strategic plan outlines the organization's involvement is advocating for social justice, access to healthy food, and the stop's leadership role in strengthening community food security.

Weber, K. (Ed.). (2009). Food, inc.: A participant guide: How industrial food is making us sicker, fatter, and poorer and what you can do about it. Jackson, TN: Public Affairs.

A compilation of 25 essays on topics such as biofuels, over use of pesticides, genetically modified 'frankenfoods', large agribusinesses, and hunger, written by experts in food production and global food distribution, is thought-provoking and informative. Topics are presented from a variety of different perspectives, allowing the reader to take away their own views and interpretation of the issues surrounding global food production, distribution and the future of our food resources. Also a great documentary film (see film bibliography).

World Vision Canada. (2008). Food fight: your guide to action on the food crisis. Mississauga, ON: World Vision Canada.

From the World Vision website: While 850 million people worldwide already experienced chronic hunger, experts say that recent changes in fuel and food prices have driven another 100 million people into the same condition. As a response, World Vision has launched Food Fight—an action guide for youth on the global food crisis. Food Fight is filled with information on the facts and causes of the food crisis, tools to engage your school as well as practical things you can do to make a difference.

ORGANIZATIONS/PROGRAMS

CHF—Global Education Program
CHF, (nd). Look Deeper at Global Issues(Grades 7-10 and 11-12) - Global Education Program. Ottawa, Canada: CHF. These books look at a number of Global Issues and provide teachers with lesson plans and reproducible handouts. At the Grades 12—11 level, there is a workshop on the World Food Crisis, focusing on 'the reason behind the rising prices, its impact on the poor and how CHF's Sustainable Livelihoods approach is helping people to battle the food crisis'.

A formal presentation about the World Food Crisis (an CHF presenter or slide show) is followed by group work. Lesson plans for teachers are included and reproducible handouts are provided for student use.

In addition, the materials for presentations and handout may be found at the following website:
http://www.chf-partners.ca/teachers/presentations.shtml
CPAR—Tools for Learning—Food Security Lessons for Geography and Family Studies

General information about the organization and educational resources may be downloaded from *http://www.toolsforlearning.ca/.*

Online Resources specifically related to food security may be downloaded—expectations, teacher instructions (3 lessons), slide show, student handouts from *http://www.toolsforlearning.ca/ontario_tools_for_learning.asp*

Dietitians of Canada
An online source of reliable nutrition information and resources developed according to Canadian nutrition standards. Website includes links to labelling information and teaching resources, dietary analysis programs, and current nutrition information for all age groups. www. dietitians.ca

Engineers Without Borders
This organization offers presentations for secondary students on several topics—Food for Thought being one. The engineering students discuss food security with the students and then students complete a simulation exercise. They address the topic of food security, include a case study comparing Ghana and Burundi and then discuss briefly what Canada is doing to address food security issues.

If not in an area serviced by this organization, you may download the presentation and activity.
The package of lessons is available at *http://www.ewb.ca/en/whatwedo/canada/projects/index.html.*

The lesson package "Food for Thought" can be found at http://www.ewb.ca/en/whatwedo/canada/projects/hso/teachers/f4t/index.html. This includes expectations, slideshow, teacher instructions and reproducible sheets all available for download and use in the classroom.

United Nations—Food and Agriculture Organization
Visit the following website for more information on global food related issues. Maps, statistics and written reports are available. The link to this site is *http://www.fao.org/economic/ess/en/*

Worldwatch
This organization addresses the topic of food issues as an ongoing area of concern. In addition, the magazine contains articles on population and sustainable development. The following article fits nicely with discussions on the importance of local food.

DeWeerdt, S. (May/June 2009). Is local food better?. WorldWatch, Volume 22, Number 23, 6-10.

Other materials can be found online at:
http://www.worldwatch.org/node/4132
http://www.worldwatch.org/node/827
http://findarticles.com/p/articles/mi_hb6376/is_3_16/ai_n28997349/

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