

11. The Life Cycle of Food

Far from innocuous, eating is one of our daily activities that has the biggest impact on the environment. Through examining the life cycle of various foods from the field to our plates, the students discover the 3N's-F principle (Non-packaged, Not far, Natural and Fair). They are then asked to put these principles into practice as a way to make healthier, more ecological and fairer food choices. In so doing, they become more enlightened consumers!

Learning Objectives

Have students:

- Develop their critical sense by examining and comparing the impact of a range of food items on our health, the environment and society.
- Become aware of how the conventional food system works and its complexities.
- Learn about the main stages in the life cycle of food.
- Become aware of the purchasing power of the enlightened consumer (activist).

Subjects

- English Language Arts
- Science and Technology
- Geography

Materials

- 1 copy per team of the "3N's-F" chart (Appendix 1.2) and the "Life Cycle of Food" summary (Appendix 2).
- Packaging from the products mentioned in Appendix 1.1 or photocopies of this appendix, so that every group can compare two similar products.

Preparation

- Become familiar with the 3N's-F principle by reading the book *L'envers de l'assiette et quelques idées pour la remettre à l'endroit* (optional – see References).
- Become familiar with the content of the appendices and print copies of them according to the number of students.
- Bring in the products specified in Appendix 1.1 (or cut out the product descriptions)*.
- Prepare the material for the students (cut out the life cycle stages in Appendix 2 for each of the teams).

Did you know?

- **Non-Packaged (no or little packaging):** In 2006, Quebecers generated more than 24 tonnes of household waste daily - the equivalent of 3 million bags of garbage.
- **Not Far:** Food eaten in Quebec travels on average from 2,400 to 4,000 km to get from the fields to our plates.
- **Natural:** The food we eat, mainly due to the pesticide residues the food contains, is responsible for 85% to 90% of our exposure to chemicals.
- **Fair:** From 1977 to 1998, the price of a box of Corn Flakes rose by \$2.44, while the price paid to farmers for the corn content of a box rose by only \$0.03.

* **Note :** To make the activity even more interesting, ask students to bring food packages of their favorite snacks for them to analyze.

Main Activity

- Read the facts in the section “Did You Know?” out loud to the class. What do the students think of these statistics?
- Explain the activity to the students. Tell them that their task is to analyze some common food products based on their impact on human health, the environment and society, using the 3N’s-F criteria: Non-packaged, Not far, Natural and Fair.
- Divide the class into teams of two to three students.
- Hand out two similar products (or product descriptions) from Appendix 1.1 to each group.
- Ask the students to complete the 3N’s-F chart (Appendix 1.2) to help determine the impact of each product. Mention that the lower the score, the bigger the impact of the product in question on our health and the environment.
- Next, hand out Appendix 2 (cut out beforehand) to each group and ask the students to put in order and illustrate the life cycle stages of a food from the time it is planted to the time it is returned to the earth in the form of garbage or compost (pay special attention to the energy used in each stage of the life cycle).

Integration

Following this analysis activity, discuss the results with the group.

- Were you surprised by some of the facts discovered? Which products received the highest and lowest scores? Why?
- Was it easy or difficult to rate each food item? Why? How can we assess fresh

produce (e.g., tomatoes), when there is no label, description, or packaging, etc.?

- Which of the products examined has the least impact on your health and the environment?
- Were you aware of the impact that your food choices have? Will this activity change the way you consume? If so, how?
- Assessing food products might seem complicated. However, making more responsible choices that are better for your health and the environment and fairer for the producers can be quite simple. What strategies or things can help us become more enlightened consumers? (e.g., paying attention to logos and labels; choosing foods that are fresh, local, fair, less processed; giving preference to bulk foods, dishes that can be used for several meals, doing more cooking, etc.).
- Where can we find more “responsible” food items, i.e., more ecological, better for our health and fairer for farmers? (farmers markets, CSA, independent grocers, gardens, etc.).
- What do you think of the life cycle of food? (long, complex, etc.)? Were you aware of all these stages?
- Now, think about and compare the path taken by a conventional tomato from Mexico to a tomato from Quebec sold at a farmers market. Which path is the shortest? Which path is the best for our health, the environment and solidarity? Why?



Enrichment

For their homework, ask the students to do a drawing that illustrates and compares the life cycles of the two foods that they analyzed. For help, they can consult Appendix 2.

Ask the students to create an advertisement that will help other students make healthier, more environmentally-friendly and fairer food choices. Show them the following video for inspiration: <http://fr.youtube.com/watch?v=hOQkBP5nioY>.

With the whole group, examine and compare the path taken by coffee from the conventional coffee trade with the path of fair trade coffee. See: <http://www.equiterre.org/equitable/guide/contenu/index.html#id3>. Next, describe what the path might be for a vegetable from a community supported agriculture setting (direct sale to consumer in form of weekly organic basket during the harvest season).

Take Action!

To promote more responsible food choices (healthier, more environment-friendly, fairer for farmers), encourage the students, with their families to:

- Purchase food directly from farmers by going to farmers markets (public markets), ordering organic baskets, or buying from produce stands right on the farms during the harvest season. See: <http://www.equiterre.org/agriculture/paniers-Bios/index.php>.
- Buy food with as little processing and packaging as possible, in order to get more for their money, but with less sugar and salt.
- Read the labels on the foods they buy at the supermarket and demand that the origin of the products be shown (letter, petition, etc.).

References

- Waridel, Laure. *L'envers de l'assiette et quelques idées pour la remettre à l'endroit*, Écosociété, (2005), 173 pages.
- http://www.radio-canada.ca/audio-video/pop.shtml#idMedia=1582937&urlMedia=/Medianet/2008/CBFT/Lepicerie200801091930_1.aspx
- Stages of transforming wheat into bread (in English). See: http://www.ext.vt.edu/resources/4h/virtualfarm/wheat/wheat_farm_to_you.html#
- *Free Trade: Is it Working for Farmers? Comparing 2007 to 1988*
<http://www.nfu.ca/briefs/20071988%20vs%202007%20FINAL%20bri.pdf>

Appendix 1.1 🍎 Foods to Analyze

Apple Juice

Container:

- Plastic 2 + paper
- Size 1.89 L

What the product

claims: "Apple juice, fresh pressed", "original taste", "Product of Quebec".

Ingredients: apples, potassium sorbate

Additional Information:

Tradition is a Quebec company.



Citrus Fruit Drink

Container:

- Tetra Pak (cardboard-like) and plastic with no number
- Size: 10 x 220 ml

What the product claims: "real fruit drink", "no colouring or artificial flavour added".

Ingredients: water, 45% fruit juice, sugar, citric acid, natural flavours, Vitamin C.

Additional Information: *Deli-cinq* (Five Alive) is a Coca-Cola Inc. registered trademark.



Tropical Fruit Salad

Container:

- Plastic 1, plastic with no number, paper, size 4 x 107 ml

What the Product Claims:

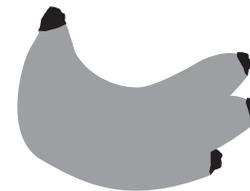
"tropical fruit in fruit juice"

Ingredients: citric and ascorbic acid additives, natural flavour and beta-carotene, banana purée.



Équicosta Fresh Bananas

What the Product Claims: Certified organic and fair trade



ÉQUICOSTA



Appendix 1.1 🍌 Foods to Analyze

Prepared Organic Lasagna

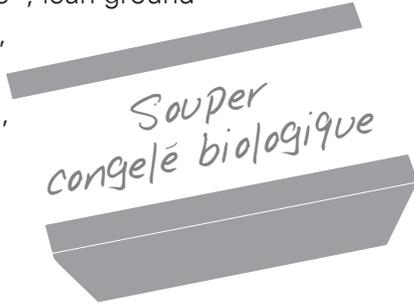
Container:

- Plastic 5, plastic with no number, cardboard
- Size 340 g (1 portion)

What the Product Claims:

"Product of Canada"

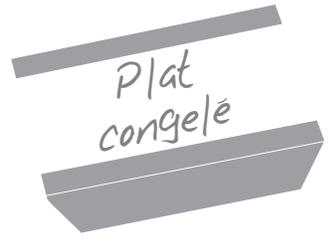
Ingredients: cooked pasta*, water, cheeses* (ricotta, cheddar, mozzarella [milk*, whey*, bacterial culture, sea salt, microbial enzymes]), tomatoes*, (tomatoes*, tomato juice*, sea salt, calcium chloride, citric acid), tomato paste*, lean ground beef*, milk*, onions*, wheat flour*, sugar*, sea salt, canola oil*, fine herbs*, garlic*, white wine vinegar*, butter*, parsley*, spices.
 * = organic



Prepared Frozen Pasta

Container:

- waxed cardboard
- size: 241 g (1 portion)



What the Product Claims:

"Product of the U.S.A.", "authentic recipe".

Ingredients: cooked pasta (containing enriched wheat flour), tomatoes (containing salt, calcium chloride, citric acid), water, onions, sugar, garlic, celery, olive oil, salt, maltodextrin, vegetable oil margarine (soy), spice, modified cornstarch, parsley flakes, xanthan gum.

Commercial Cookies

Container: cardboard box, plastic with no number, 283 g, individually wrapped.

What the Product Claims: "natural and artificial flavours", "Made in Canada".

Ingredients: sugar, enriched wheat flour, vegetable oil (containing palm oil and modified palm kernel oil), hydrogenated palm kernel oil, mixture of eggs, water, glucose, cocoa, milk ingredients, modified starches, salt, glycerine, baking powder, soy protein, mono and diglycerides, modified cellulose, sorbitan monostearate, sodium bicarbonate, polysorbate 60, potassium sorbate, acidic sodium pyrophosphate, cornstarch, soy lecithin, xanthan gum and guar gum, artificial flavour, colouring (containing tartrazine).



Milk Chocolate

Container: paper, plastic with no number

What the Product Claims: "fair treatment for farmers", "100% organic".

Organic Ingredients:

powdered whole milk, Syramena raw cane sugar, cocoa butter, cocoa liquor, sucanat non-refined cane sugar, ground hazelnuts, powdered vanilla, 38% cocoa (produced by Concado, a small farm cooperative in the Dominican Republic).



Appendix 1.2 🍌 3N's-F Chart: Non-Packaged, Not Far, Natural and Fair

NON-PACKAGED	Product 1 (Ex. Apple Juice)	Product 2 (Ex. Citrus Fruit Juice)
Does the product: <ul style="list-style-type: none"> ● Have no packaging? (5) ● Have a little packaging? (2) ● Have excessive packaging (0) 		
Does the packaging require a lot of energy to produce (see Table 1)? <ul style="list-style-type: none"> ● Less than 1,000 kilocalories (1) ● More than 1,000 kilocalories (0) ● Impossible to determine (0.5) 		
Is the packaging reusable or recyclable (consult the What to Recycle appendix)? <ul style="list-style-type: none"> ● Yes, it is even reusable? (3) ● Yes, easily (2) ● Yes, but it requires a lot of energy (1) ● No (0) 		
NON-PACKAGED TOTAL		

Table 1: Energy Required for the Production of Packaging (in Kcal)

Small wooden fruit container (for strawberries, etc.)	69
Styrofoam plate (recycling logo no. 6)	215
Glass jar (16 oz.)	1 023
Bottle of Coca-Cola, non-recyclable (16 oz.)	1 471
Aluminum can (12 oz.)	1 643
"TV dinner" aluminum container	1 496
Plastic milk bottle (1.9 litres)	2 159
Bottle of Coca-Cola, recyclable (16 oz.)	2 451
Polypropylene bottle (250 ml)	2 752



Appendix 1.2 🍅 3N's-F Chart: Non-Packaged, Not Far, Natural and Fair

NOT FAR	Product 1	Product 2
How many kilometres did the food item travel (see table 2)? ● Over 1,000 km (0) ● 500 km to 999 km (1) ● Less than 500 km (3)		
NOT FAR TOTAL		

Table 2: Distance Travelled by Food from Field to Consumer

Origin	Distance Travelled (km)
Washington, D.C.	3 053
Australia	10 937
Thailand	13 163
New Zealand	13 164
Quebec	350
Belgium	8 582
China	12 392
Elsewhere in Canada	695
Mexico	4 692
California	3 665
Chili	10 108



Appendix 1.2 🍅 3N's-F Chart: Non-Packaged, Not Far, Natural and Fair

NATURAL	Product 1	Product 2
Did processing of the food item require much energy (see Table 3)? ● Yes, more than 1,000 kilocalories ● No, less than 1,000 kilocalories		
Did processing of the food item require much energy (see Table 3)? ● Yes, more than 1,000 kilocalories ● No, less than 1,000 kilocalories		
Did processing of the food item require much energy (see Table 3)? ● Yes, more than 1,000 kilocalories ● No, less than 1,000 kilocalories		
NATURAL TOTAL		

Table 3: Energy Required to Process Certain Foods (in Kcal/kg)

Instant coffee	18,948
Chocolate	18,591
Cereal (breakfast)	15,675
Cane sugar	3,370
Frozen fruits and vegetables	1,815
Soft drink (per litre)	1,425
Canned fruits and vegetables	575



Appendix 1.2 🍅 3N's-F Chart: Non-Packaged, Not Far, Natural and Fair

FAIR	Product 1	Product 2
<p>How many intermediaries were there from the time the food was harvested to the time it ended up in the hands of the consumer?</p> <ul style="list-style-type: none"> ● Likely many because the food is highly processed (1) ● Probably less than four, because the food item has undergone little processing, it was grown in Quebec and it was purchased directly from the producer (4) 		
<p>Did the producer (farmer, etc.) receive a fair price (see Table 4)?</p> <ul style="list-style-type: none"> ● Yes, it's a local product sold directly by the producer or with few intermediaries (4) ● Yes, it's a certified fair trade product (3) ● Possibly not. It's a local product, but one that went through many intermediaries (often the case for processed food) (1) ● Probably not. It's an imported product that has gone through many intermediaries (0) 		
FAIR TOTAL		

Tableau 4 : Logos to Look Out For

A food item is certified fair trade in Canada if it displays this Transfair Canada logo.	
A food item is produced in Quebec if it displays the logo to the right.*	
A food item is certified organic in Quebec if it displays one these six logos.	

* **Beware** : This logo may also appear on products that do not contain locally-produced ingredients if 50% or more of the production costs (labor, transformation, packaging, etc.) were spent in Quebec. For example, it is possible to find mango juice with this logo even though mangoes are not grown in Quebec.

Appendix 1.2 🍅 3N's-F Chart: Non-Packaged, Not Far, Natural and Fair

3N's-F	Product 1	Product 2
<p>Now calculate the total ecological footprint of your food items:</p> <p>NON-PACKAGED score _____</p> <p>+ NOT FAR _____</p> <p>+ NATURAL _____</p> <p>+ FAIR _____</p> <p>= Footprint _____</p> <p>The higher the score, the better the food item is for the environment, your health and solidarity with producers.</p>		
3N's-F GRAND TOTAL		



Appendix2 🍅 Life Cycle of Food – Example: Food Plant

Main Stages	Specific Steps
Production	<ul style="list-style-type: none"> ● Purchase of production input: seeds, fertilizer, pesticides and gas
	<ul style="list-style-type: none"> ● Planting and growing food plant: seeds, sprouts, care and harvesting
Distribution and Processing of Food Item	<ul style="list-style-type: none"> ● Transporting harvest to warehouse
	<ul style="list-style-type: none"> ● Transporting harvest to processing plant
	<ul style="list-style-type: none"> ● Processing
	<ul style="list-style-type: none"> ● Packaging
	<ul style="list-style-type: none"> ● Transporting to distributor
	<ul style="list-style-type: none"> ● Transporting to retailer
Consumption	<ul style="list-style-type: none"> ● Purchase by consumer from retailer
	<ul style="list-style-type: none"> ● Transportation to home of consumer or
	<ul style="list-style-type: none"> ● Preparation and consumption of food
Post-Consumption	<ul style="list-style-type: none"> ● Disposal of food scrapes in the garbage pail or composter (where applicable)
	<ul style="list-style-type: none"> ● Re-using packaging, or putting it in garbage or recycling bin

Simplified Life Cycle of a Food

Production	<ul style="list-style-type: none"> ● Production of crop production input (seeds, fertilizers, pesticides, and gas) ● Crop production by farmer
Distribution and Processing of Food	<ul style="list-style-type: none"> ● Transportation ● Processing ● Packaging ● Distribution ● Retailer ● Restaurant
Consumption	<ul style="list-style-type: none"> ● Consumption
Post-Consumption	<ul style="list-style-type: none"> ● Reuse, garbage, recycling or composting

