FROM FIELD TO TABLE:

TAKE THE GRAIN TRAIN FROM BC'S PEACE RIVER AREA AND BEYOND

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British Columbia Agriculture
in the Classroom Foundation
Summer Institute 2006 Unit Plan
For Home Economics, Foods and Nutrition 10

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Summer Institute for Educators

This document is the result of the author's participation in the BC Agriculture in the Classroom Foundation's Summer Institute for Educators. This third year level course in curriculum design is offered through the University of British Columbia's Faculty of Education's Office of External Programs.

Participants (up to 20 educators from Kindergarten to Grade 12) spend one week at the Montfort House Rural Resource Centre situated on Vancouver Island. Here they develop a number of practical teaching strategies for their classrooms using examples drawn from the agricultural, environmental, economic and nutritional concepts featured in the BC Integrated Resource Packages for their particular grade or subject area.

The agricultural community sponsors participants for the costs of learning resources, meals, tours and accommodation.

Participants taking the course for credit create teaching modules such as this to share with other educators from around the province.

Applications can be made on the BC AITC website at www.aitc.ca/bc.

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Introduction

In my northern BC classroom in Kitimat, mountains, ocean and rain forest surround the community. Due to its extreme climatic conditions, the landscape is unsuitable for commercial agriculture. In this unit, students explore the agriculture that exists farther north and east to our neighbours in the Peace River.

The major goal of this unit is to develop a greater understanding of the nutritional benefits of whole grain products. As students explore the benefits of eating whole grain products, the opportunity to adjust eating patterns to healthier ones is provided. By using a variety of hands-on food experiences, including growing, grinding and sampling homemade products, students will be provided with interactive learning experiences typical in a Home Economics classroom. Teenagers will be provided with the opportunity to analyze their food choices and to determine if their knowledge and experience of eating their own homemade products will change their perspective about eating whole grains in the future. Hands-on components of this unit, focusing on a mini grain production food system in the classroom, will provide students with a greater understanding of this system. The northern connection will promote place-based education in that it serves to eliminate the possible belief of my students that not much grows 'up north'.

Patricia Kuppers

IRP Connections

This unit can be used to meet learning outcomes, prescribed in the **DRAFT 2006 Home Economics, Foods and Nutrition 10,** the mandated curriculum provided by the Ministry of Education in BC:

Kitchen Basics
A2 demonstrate the ability to accurately evaluate and follow a recipe using appropriate equipment and measuring techniques (all recipes in this unit)
A3 identify various types of equipment used for food preparation (including grinding wheat, and growing wheat grass)
A4 demonstrate organization and cooperation in partner and group work, including integration of planning skills (e.g., task sequencing, time management)

Role of Ingredients
A5 compare like ingredients and how they affect nutrition, flavour, texture, taste, and quality of the product (muesli recipe and international recipe)

Food Preparation Techniques
Food Products
B1 apply cooking principles to prepare healthy dishes and meals, incorporating presentation (recipes)
Methods of Cooking
B2 use a variety of cooking methods to prepare food (recipes)

Nutrition and Applications
C1 identify and explain the importance of basic categories of nutrients required for healthy living, including:
– complete and incomplete proteins
– simple and complex carbohydrates
– saturated and unsaturated fats
– vitamins and minerals
– fibre

Social and Economic Influences

D3 describe the cultural origins of menus, recipes, ingredients, and meal etiquette of a variety of ethnic (grain from another culture) regional, and local cuisines, as represented in Canada

The activities in this unit are designed to develop:

- An understanding of BC's grain food system
- An understanding of proper nutrition related to grain products (healthy eating)
- An understanding of the principles of food processing and preparation (growing, grinding, granola)
- A hands-on familiarity with some of the foods and food preparation techniques that are employed by people all over the world (grain product cooked from other cultures)

Cross-curricular themes

Drama incorporated into research presentation

Group work throughout this unit with appropriate assessment criteria

Internet research links technology into the home economics classroom

Social Studies – BC land and transportation system – reinforces geography of our province

Science 9 – reinforcement of life science

Science 10 – alternative bio-fuel – resolving socio-scientific issues

This unit has been divided by topic. The topics may take one to three days to cover depending on the depth of coverage and the activities selected.

Table of Contents

Before beginning this unit you will need to do the following:

1. Contact BC Agriculture in the Classroom Foundation www.aitc.ca/bc and order:
   - copies of the ***Agriculture Fish & Food in BC*** **maps**
   - copies of ***All About Food - Agri-Food Facts***
   - a copy of ***"Grow BC" A Guide to BC's Agriculture Resources*** (there may be a copy in your school library)
2. Find a source for wheat seeds.
3. Collect trays and containers and soil for growing wheat seeds.
4. Buy the ingredients for the Museli and the Whole Wheat Buns.
5. Arrange to borrow a mill or have a guest speaker in to demonstrate grinding your own flour.

Topic #1 – WHAT'S FOR BREAKFAST ON THE GRAIN TRAIN – INTRODUCTION TO THE GRAIN SYSTEM

Objective: SWBAT understand the wheat production system in BC

MATERIALS NEEDED:

1. Chart paper and felt markers, 1 set for each group of 4.
2. A set of ***Agriculture Fish & Food in BC*** **maps** (order from www.aitc.ca/bc). One per table group works best.
3. Photocopy the black and white version of *Agriculture Fish & Food in BC* map (from *"Grow BC" A Guide to BC's Agriculture Resources,* p. 9) for each student.
4. Overhead copy of ***Agriculture Fish & Food in BC*** **Map** (make from p. 9. *"Grow BC" A Guide to BC's Agriculture Resource*).
5. Copies of **The Farm Connection** flow chart p. 188 *"Grow BC" A Guide to BC's Agriculture Resource,* one per group and an overhead copy for debriefing.
6. Copies of ***All About Food - Agri-Food Facts*** (order from www.aitc.ca/bc). Make an overhead of p. 23 Canadian Agriculture from sea to sea (this has a nice synopsis of what is grown in each province). If you have multiple copies this may not be necessary.
7. *Optional: Canadian Map showing Canada's Land Cover (see references); samples of each of the agricultural products in small glass jars to show students (wheat; barley; dried pea; canola; oats).
8. Copies of **Growing Wheat Grass Instructions,** at least one per table group or one per student.
9. Plastic trays with drainage holes and drip liners to fit, 1 per group of 4.
10. Potting soil for indoor plants and trays with drainage holes and catch basins (from a garden center). Grow lights are helpful but not necessary. See Lesson 1 appendix for detailed growing instructions and tips.
11. Wheat seeds obtained from Health Food store (try organic food Co-op in Vancouver such as Anita's website: http://www.anitasorganicmill.com/).

INTRODUCTION – WHAT DID YOU HAVE FOR BREAKFAST?

1. What did you have for breakfast? Ask students to quickly say what they had for breakfast and record on board or overhead in Food Guide groupings (i.e. Cereals and Grains, Fruits and Vegetables, Dairy, Meat and Alternatives).

2. Transition to today's topic by clarifying the difference between cereals and grains (cereal = prepared foodstuff made of grain, root Ceres – the Roman goddess of agriculture) and grain = the seed or fruit of a cereal grass).

STUDENT ACTIVITY – FOOD PRODUCTION FLOWCHART

Divide the class into small groups of 3 or 4. Using the grain items each person in the groups ate for breakfast today, direct students to write down as many steps and processes that they think it took to get one of these products to their table. Using the food production flow chart (p. *188 "Grow BC" A Guide to BC's Agriculture Resources*) as a start and sub-titles such as natural and human resources, inputs, production, processing, distribution, and consumer access, have students list all the steps they think or their product would have gone through to get to the table. Record steps on chart paper.

TEACHER LED – GROWING GRAIN IN BC

a. Have groups present their flow charts to the class, compare results.

b. Review **The Farm Connection** flow chart (p. 188 *"Grow BC" A Guide to BC's Agriculture Resource*) *overhead* noting the path of grain and seeds.

c. ***Agriculture Fish & Food in BC*** maps – hand out copies and use maps to identify location of grain-growing areas in BC - have *overhead* copy in use too.

d. Have students locate and record their own community, the Peace River area and the major centers for food production on their maps. Have them use a yellow pencil or highlighter to highlight the symbols for grain growing areas on their maps. Explain, using the **background information** as lecturette notes about the Peace River crops, where grains are shipped from the Peace River area and have students draw coloured lines on their ***Agriculture Fish & Food in BC*** **Map** to where BC grains are shipped and processed.

e. **Canadian Agriculture from sea to sea,** either use the *overhead* you have made of p. 23 or have the students refer to that page use to compare percentages of Canadian grains grown in each region of the country. Ask questions such as: What province produces the most grain? What provinces produce virtually no grain? How does BC rank? What might account for the variations in production?

STUDENT ACTIVITY - GROWING WHEAT GRASS SEED

In table groups have students prepare the plastic growing trays and place wheat seed in water to pre-sprout. Follow the directions on the **Growing Wheat Grass Instructions** handout.

CRITERIA FOR ASSESSMENT

Food Production Flow Chart	**Marks /25**
Group members worked together cooperatively on chart	/5
Group members worked together cooperatively sowing seeds	/5
Logical progression of food from farm to table charted	/15

Background Information

1 Grains grown in the Peace River area include Oats, Canola, Peas (the legume crop classified with grain seeds), Barley and Wheat (Glacier, 2006).

2 Oats grown in the Peace River area are sold both for human and animal consumption. Apart from local Peace River area, animal feed consumption and a few independent processors, BC oats are processed in Alberta and Oregon, USA.

3 About half the Canola grown in the Peace River area is exported in the raw form, with the balance being processed in Alberta. Canola produces high quality vegetable cooking oil and also a high protein animal feed supplement. Canola is a crop of interest to farmers in the Peace River because canola oil is an excellent oil to use to minimize consumption of trans fats and for the production of bio-diesel. These growing interests in canola will diversify markets and improve the profit potential of farmers.

4 Peas, actually a legume seed crop, are primarily exported for human food (split peas for soup) and high protein animal feed.

5 Barley is grown for both human consumption (partially chopped into pearl for soup, or milled for flour), and animal feed. Some BC Barley is malted in BC, but the majority of malt barley is processed in Alberta and Saskatchewan. Malting is a process applied to cereal grains, in which the grains are made to germinate and then are quickly dried before the plant develops. Malted grain is used to make beer, whisky, and malt vinegar.

6 About 80% of wheat grown is hard red spring wheat, which is a high quality food wheat if it grades well (quality of wheat is compared) at the elevator. Prairie spring wheat comprises the balance of the crop. The higher grade of food quality wheat is sold for human consumption. Commercial elevator companies, under the auspices of the Canadian Wheat Board, purchase the wheat and transport it via train to ports in Prince Rupert and Vancouver from which it is exported around the world. Farmers from the Peace River can choose to sell lower quality wheat either for human food or animal feed, based on price. Wheat travels within 50 km of Kitimat through Terrace on its way to the Grain Terminal in Prince Rupert, which is a great place for a field trip. Ironically BC's two large flourmills, located in Armstrong and Chilliwack, have easier access to Prairie wheat products due to southern transportation corridors. There are also small

owner-operated flourmills in BC, including organic operations, which purchase from organic growers in the Peace River area.

7 Due to tougher northern climatic conditions the harvesting of all grains in this area can be challenging and can result in lower quality grain. All low quality grain will be used in the animal feed market.

Statistics from statcan.ca:

STATISTICS CANADA (2006)			
DAWSON CREEK ELEVATOR PRICES – APPROX $ PER BUSHEL, 2006			
WHEAT – RED SPRING	BARLEY	OATS	CANOLA
$2.00-3.00	$1.30-1.83	$1.40-1.50	$5.11-6.21
AREA OF CROP SEED IN BC, IN THOUSAND HECTARES, 2006			
18.2	32.4	36.4	26.3
PRODUCTION IN BC, IN THOUSAND TONS, 2006			
30.3	46.6	33	27.7

Growing Wheat Grass Instructions

1. Prepare Trays

• Plastic growing trays either purchased or collected in advance will need to have drainage holes or slits. A drip liner or collector is also required. If excess water cannot drain away seeds will be flooded and may rot. (One or two litre milk cartons could be used. Place on sides and remove one side.)

• Virtually any soil will do for wheat grass (e.g., sterile bagged composted cow manure, sterile bagged potting soil).

2. Pre-Sprout Wheat Grass Seed Before Planting.

• Determine how much seed you will need:

60 – 80 mL for a 12 cm (4-5 inch) square tray.
125 mL for a 20 – 30 cm (11 inch) square tray.
OR spread dry seed on the bottom of the tray (before it is filled with soil) until the seed covers the bottom in a single layer.

• Put the seed into a bowl and add 2-3 times more cool water. Soak seeds overnight.

• The next day drain, rinse with more cool water and drain again and leave out at room temperature overnight then rinse and drain again.

• Continue rinsing and draining and leaving at room temperature until a small root forms (no more than 0.5 cm in length).

3. Planting

• Thoroughly moisten the soil. Allow puddles to dry.

• Rinse the seeds one last time and sprinkle them over the soil as evenly as you can. Don't worry if they look too crowded as the wheat grass plant takes up less space that the seed.

• Cover the planted tray with an inverted tray or a piece of cardboard with some holes or slits for air circulation.

• Place in a low-light, room temperature location and water **lightly** once or twice a day (The goal is to keep the sprouts moist until their roots bury themselves in the soil).

• Wait 3-4 days until it is 1-2 inches tall or until it pushes the covering tray up (it really will do that) then uncover and move to a well lit location to green your grass. Keep it moist by watering the soil daily.

• Watch it grow. It takes about 10 days to reach 15 cm tall, at which point it is ready to harvest. Cut just above the soil (scissors work well for this).

• Grass can produce a 2nd and even 3rd crop so you may continue to water the tray after you cut your first crop. The 2nd or the 3rd crop may not be as tender or big, but it is good to try growing at least a 2nd crop. Decide for yourself if it is worth it.

Note: You will get the best flavor and nutrition from freshly cut grass. Cut JUST prior to using. If you have to store transfer to a plastic bag or sealed contained and put in refrigerator. (See directions for Wheat Grass Juice – page 26)

Modified from: (SPROUTPEOPLE®) http://www.sproutpeople.com/seed/grains.html

Topic #2 – CHUGGING ALONG FROM THE FIELD TO THE STORE

Objective: SWBAT identify the key components in grain seeds, review the grains grown in the Peace River area, identify the variety of grains produced in BC, and understand the nutritional benefits of eating whole grain products.

MATERIALS NEEDED:

1. Photocopy the information on Grains from *"Grow BC" A Guide to BC's Agriculture Resources,* p. 114-115 for each group or each student depending on whether you decide to do the GRAINS ACTIVITY as group or individual work.
2. Class set of "Background Notes about the Peace River Grains" (see lesson 1).
3. Class set of the question sheet **CHUGGING ALONG FROM THE FIELD TO THE STORE.**
4. Overhead of **What are Whole Grains?** Or photocopy a class set for each student. You may want to create 4 separate overheads from the picture provided representing the husk layer (taken off and not used for human consumption), bran layer (often removed during milling – to make white flour, white rice), germ (also removed in processing) and endosperm. Lay all the overheads on top of each other to start, and when you describe the components of a grain seed have the corresponding nutrients listed on each page. Remove each page and the corresponding nutrients until you are left with the endosperm and then talk about the chemical enrichment of flour in Canada (B vitamins, iron and folic acid.)
5. Ingredients for **Muesli.**

GROWING WHEAT GRASS SEED:

Check on **Pre-Sprouting** progress and rinse seeds.

GRAINS ACTIVITY using *"Grow BC" A Guide to BC's Agriculture Resources*:

There are three possibilities for covering this portion of the lesson:

1. GROUP DRAMA PRESENTATIONS

Using "A Guide to BC's Agriculture Resources", Grains section, p. 114-115 and the "Background Notes about the Peace River Grains", divide students into groups of 4 and have each group research one of the following questions about the PRODUCTION of grains, and present a 5 minute drama presentation to represent the answers.

What are grains and where are they produced?
How many grains are produced in the Peace River area and elsewhere in BC?
How are grains produced?
How is grain used?
What happens after the grain leaves the farm?
What challenges do grain producers face?
Who is involved in producing grain?
As the drama presentations are made the students can fill in their worksheets with the information gained.

2. *COOPERATIVE LEARNING JIGSAW*
   Divide class into groups of 7. Have students number off 1 to 7. Number 1 is responsible for answering question 1; number 2 is responsible for answering question 2 and so on. Once they have completed their section, they must teach the rest of their group their section and make sure that they fill in the answers on their question sheet.

3. INDIVIDUAL STUDENT WORK
   Each student can be given an information sheet and a question sheet. They can work individually to complete the questions.

TEACHER-LED PRESENTATION ON PARTS OF A WHEAT KERNEL:

Using the overhead **What are Whole Grains?**, explain to students that all grains start life as whole grains. In their natural state growing in the fields, whole grains are the entire seed of a plant. This seed (which industry calls a "kernel") is made up of three edible parts: the bran, the germ, and the endosperm. The outer covering that is indigestible and removed during milling is called the hull.

The **bran** is the multi-layered outer skin of the kernel, and is tough enough to protect the other two parts of the kernel from assaults by sunlight, pests, water, and disease. It contains important antioxidants, B vitamins and fiber.

The **germ** is the embryo, which if fertilized by pollen, will sprout into a new plant. It contains many B vitamins, some protein, minerals, and healthy fats.

The **endosperm** is the germ's food supply, which provides essential energy to the young plant so it can send roots down for water and nutrients, and send sprouts up for sunlight's photosynthesizing power. The endosperm is by far the largest portion of the kernel. It contains starchy carbohydrates, proteins and small amounts of vitamins and minerals. Whole grains contain all three parts of the kernel. Refining normally removes the bran and the germ, leaving only the endosperm. Without the bran and germ, about 25% of a grain's protein is lost, along with at least seventeen key nutrients. Processors add back some vitamins and minerals to enrich refined grains, so refined products still contribute valuable nutrients. But whole grains are healthier since they provide more protein, more fiber and many important vitamins and minerals.

Whole grains may be eaten whole, cracked, split or ground. They can be milled into flour or used to make breads, cereals and other processed foods. If a food label states that the

package contains whole grain, the "whole grain" part of the food inside the package is required to have virtually the same proportions of bran, germ, and endosperm as the harvested kernel does before it is processed.

Nutritional details – Whole grains are good sources of B vitamins and iron. Refined grains have the bran and germ removed, which also removes many nutrients and fiber as well. B vitamins and iron are added back to refined grain products labeled "enriched". Most grain products are fortified with folic acid, and some are fortified with additional vitamins and minerals.

"LET'S TRY SOME WHOLE GRAINS" - PRACTICAL ACTIVITY:

Explain to students that they are going to make **Muesli**, a popular breakfast dish (breakfast cereal) from Germany and Switzerland based on uncooked rolled oats and fruit. (For more information on muesli try http://en.wikipedia.org/wiki/Muesli)

Using a typical lab format, have students work in groups of four to gather the ingredients and then prepare a small bowl of muesli for sampling. Have the students choose the ingredients they want as a table group, then divide the responsibilities for gathering the ingredients. Remind them that before the add the milk or yogurt they should taste each of the three grains (wheat, oats and barley) and determine which of the three they like the best.

Criteria for assessment of drama presentations:

Grains – group presentation	**Marks**
Presentation	**/25**
Group members – participation equal	/5
Answers to questions – included in presentation	/5
Rough answers on hand-out sheet given to group	/5
Cooperation and group work	/5
Interesting and creative presentation	/5

Criteria for assessment of muesli presentations:

Grains – Muesli
STUDENT FLAVOUR EVALUATION /12
Flavour of wheat flakes
Flavour of barley flakes
Flavour of oats
Favourite grain
Why–did you like/not like the Muesli RECIPE? Explain briefly.
Is there an other ingredient you would like to include with your Muesli?

Name_____

Block_____

CHUGGING ALONG FROM THE FIELD TO THE STORE

Questions on Grains from *"Grow BC" A Guide to BC's Agriculture Resources*, p. 114-115.

1. a) What are grains?_____(1)
   b) What are the major categories of grains?
   _____(6)
   c) What are the 3 main parts of a wheat kernel?
   _____(3)

2. How many grains do we produce?
   a) Name the grains that are produced in the Peace River area and elsewhere in BC?_____(3)
   b) What are the main uses of grains produced in BC?
   _____(2)

3. How are grains produced?
   a) What is the difference between spring and winter wheat?
   _____(1)
   b) Name two procedures farmers do to prepare their fields for planting._____
   _____(2)
   c) How can you tell that wheat is ready for harvest?
   _____(1)
   d) How many kernels in a head of wheat?
   _____(1)
   e) Name the machine that is used to separate the seeds from the chaff and straw. _____(1)

4. How is grain used?
   a) In what forms is grain consumed by humans?
   _____(3)
   b) Grains are a source of what nutrients?
   _____(5)

5. What happens after the grain leaves the farm? Fill in the following flow chart.

Grain is taken to_____to be _____ and _____. _____and _____are exported by the _____. Most wheat eaten by people is _____this involves _____and _____. Wheat is then _____so that the _____can be removed. Then it is passed through _____to _____the grain. For white flour the _____is removed. Barley and oats are usually processed into _____. Some barley is malted to use in making _____. (16)

6. a) What is the main challenge that grain producers face?

_____(1)

b) What is done to address this challenge?

_____

_____

_____(3)

7. Who is involved in producing grain?

a) List all those who work **on** the farm

_____(2)

b) List all those who work **off** the farm

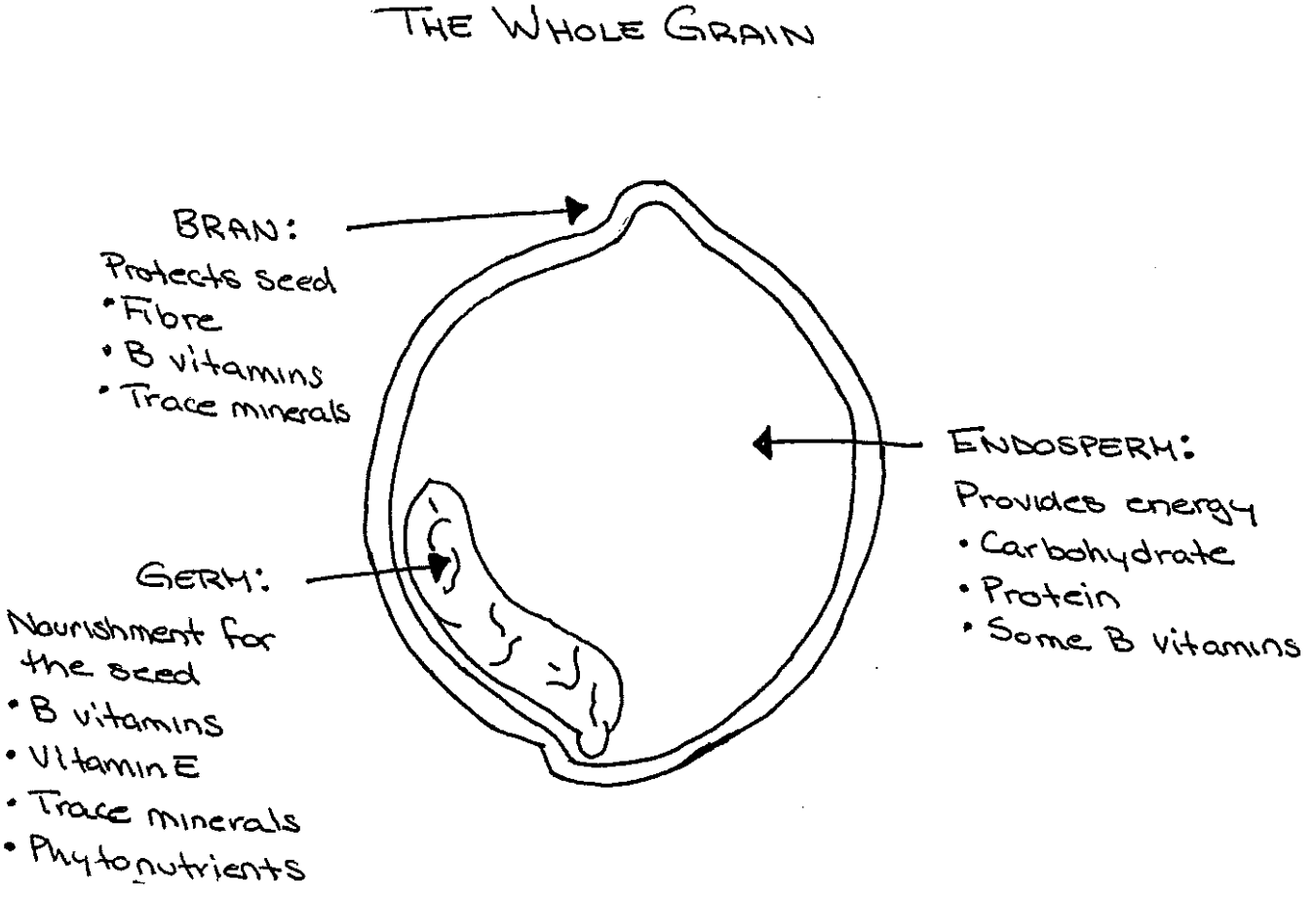
_____

_____

_____(13)

What are Whole Grains?

Whole grains have three basic parts: the bran, germ, and endosperm.



Wheat Kernel

The refining (milling) process strips whole grains of the bran and germ, stripping away nearly all of the fiber and much of the nutrients. The refined grain products must then be enriched or fortified with vitamins and minerals.

Muesli Recipe

Ingredients for Sampling (for a Group of 4)

Grains:			
Regular rolled oats (not instant)	125 mL	or	1/2 cup
Barley flakes	125 mL		1/2 cup
Wheat flakes	125mL		1/2 cup

(other grain products may be included, e.g., oat or wheat bran, wheat germ)

Fresh Fruit – Choose 1 of:	
Banana (sliced)	1/2 per group
Apple (cored & chopped)	1/2 per group

(or other fruit that may be in season grapes, blueberries, strawberries, raspberries, peaches, pears, etc.)

Dried Fruit		
Raisins	75 mL	1/3 cup

(or other dried fruit e.g., cranberries, banana chips, dates, currants, apricots, peaches, etc.)

Nuts and Seeds – Choose 2 of:		
Sunflower seeds	50 mL	1/4 cup
Pumpkin seeds	50 mL	1/4 cup
Coconut	50 mL	1/4 cup
Chopped nuts	50 mL	1/4 cup

(e.g., peanuts, slivered almonds, walnuts, pecans, hazelnuts, etc.)

Cinnamon sugar	30 mL sugar + 0.5mL cinnamon
Milk or yogurt	50 mL per person

Equipment:
Bowls and serving spoons for each ingredient
Measuring cups
Individual bowls and spoons for each student

Directions:

1. Gather the ingredients and place in individual bowls in the center of your table.
2. Line up the serving bowls in a row with tablespoons to serve the grains and teaspoons to serve the dried fruit, nuts and seeds.
3. Take a spoonful of each of the ingredients to mix together in your own bowl. Sprinkle cinnamon sugar on top of the mix.
4. Pour milk or yogurt over muesli. Enjoy!

Modified from: *Take Your Health into Your Own Hands,*
BC Dairy Foundation, 2006 Nutrition Education Units for Secondary Level, p. 37.

Topic #3 – GRINDING TO A STOP IN CANADA

Objective: SWBAT identify the processes used to transform and distribute wheat after leaving the farm.

MATERIALS NEEDED:
1. Overhead of **Making Bread**, p. 14, *All About Food Agri-Food Facts*
2. Red Spring Wheat from BC source, try **http://www.anitasorganicmill.com/index.htm** If you can't get wheat kernels then substitute wheat flakes.
3. Grain mill or several blenders.
4. **Whole Wheat Bun** recipe, ingredients and equipment.
5. Loaf of whole grain bread for discussion.
6. Access to internet video clip entitled BC Farmer Drives His Combine To Ottawa: http://www.cbc.ca/news/background/agriculture, http://archives.cbc.ca/IDCC-1-69-1720-11832/life_society/family_farm/

GROWING WHEAT GRASS SEED:

Check on **Pre-Sprouting** progress and rinse seeds. Plant if that stage has been reached.

PRACTICAL ACTIVITIES:
Day 1:

1. Grinding of wheat in mill (borrow mill from local organic aficionado if you can) – groups create own bran, and flour using red spring wheat from BC. Blenders can be used if grinding a small quantity at a time. If you are unable to get wheat kernels to grind you can substitute wheat flakes and have students use the blenders to make flour. You may find that making all the flour for the whole-wheat buns is too time consuming and just have students make 125 mL or 250 mL to learn that they can make flour from grain products and then just use regular whole wheat flour for the rest of the recipe.
2. Prepare whole-wheat buns from own flour (or a combination of their own flour and commercially available whole wheat flour). This is a 2 day lab as the dough is made one day and allowed to rise in the refrigerator and shaped and baked on the second day.

REGULAR LAB CRITERIA FOR ASSESSMENT OF THIS CLASS

PRACTICAL ACTIVITIES:
Day 2:

1. Remove dough from refrigerator, preheat ovens, shape dough, let rise, and bake.

TEACHER-LED DISCUSSION – while buns are baking:

1. Show the overhead of **Making Bread, p. 14,** ***All About Food Agri-Food Facts.*** Ask students how closely their buns followed the processes in the overhead. Show the students a loaf of whole grain bread that you have purchased from the store. Tell them the price you paid. Ask students to guess how much money from the loaf of bread went to the farmer. Have them write their guess on a piece of paper and fold the paper so no one can see.
2. Introduce the **video clip** from CBC archives. Ask students why a farmer from BC might drive his combine to Ottawa. Then view the clip and discuss. Show the sample of final product – a loaf of whole grain bread – discussing store pricing vs. farmer pricing. Twenty-five years ago a loaf of bread cost about 50 cents. Of those 50 cents, the farmer got about 9 cents (or 19%). At this point, have students report on their guesses of how much a farmer today gets from a loaf of bread. Today a farmer gets about 8 %. Do the calculation to determine how much the farmer/producer would get from the bread you purchased. Compare student answers with the actual. Ask them their reasons for the figures they determined. Discuss what this means for BC farmers and our ability to feed ourselves.

REGULAR LAB CRITERIA FOR ASSESSMENT OF THIS CLASS

Whole Wheat Buns

Ingredients:

750	mL	whole wheat flour + 175 mL set aside
10	mL	yeast
60	mL	sugar
7	mL	salt
60	mL	milk powder
60	mL	molasses
60	mL	vegetable oil
750	mL	**very warm** water

Instructions:

DAY 1

1. In a medium mixing bowl, stir together dry ingredients (except the flour that is set aside).
2. In a separate bowl, stir together molasses, vegetable oil and **very warm** water (work quickly as the water must stay warm to activate the yeast).
3. Add the wet ingredients to the dry ingredients, beating until smooth (work quickly as the water must stay warm to activate the yeast).
4. Gradually add remaining flour to make a soft dough.
5. Knead on lightly floured surface until smooth and elastic (about 6 minutes).
6. Place into greased bowl, grease top of dough with oil, and cover loosely with plastic wrap. Write your name and unit on masking tape and label your bowl. Allow to rise overnight in the fridge.

DAY 2

1. Preheat oven to 220 °C or 425 °F and grease a baking sheet.
2. Punch down dough on lightly floured surface. Divide into 8 equal pieces.
3. Knead each ball and form into round shape.
4. Place balls onto greased baking sheet and cover with damp tea towel, placing baking sheet on stovetop to warm 20 minutes.
5. Remove towel and bake for 8 – 10 minutes on center rack of oven.

Topic #4 – SAILING INTO THE UNKNOWN

Objective: SWBAT become familiar with grain products grown in areas other than BC.

MATERIALS NEEDED:
1. Access to computer lab.
2. Photocopies of the **Sailing into the Unknown Research Assignment.**
3. Grocery lists in advance to enable purchase of supplies.
4. Equipment necessary for food preparation.
5. **Sailing into the Unknown Record Sheet.**

GROWING WHEAT GRASS SEED:

Check on progress. Plant if that stage has been reached. Remove cover if that stage has been reached.

RESEARCH ASSIGNMENT:

1. In partners or small groups, students are assigned a grain to research, e.g. bulgur, couscous, hominy, kasha, millet, pearl barley, quinoa, triticale, kamut, spelt, wheat berries, buckwheat, wild rice.
2. Their task is to research the grain and prepare a poster following the outline.

PRACTICAL ACTIVITY:

As part of this assignment students are to select a recipe to prepare so that other students in the class can sample the grain they researched. This will require at least one lab day when students make the product for sampling. If you have long classes you may be able to make the product and have the sampling buffet in the same class OR you may have students prepare the product one day and then in the following class have students present their posters and have the samples available. This can be done as a learning station. Students simply set up their poster and set out their food product and then students rotate from station to station filling in the **Sailing into the Unknown Record Sheet.**

REGULAR LAB CRITERIA IS USED FOR ASSESSMENT OF CLASS WHEN STUDENTS PREPARE THEIR GRAIN PRODUCTS

Sailing into the Unknown Research and Poster Assignment

Assignment Outline:

1. Using internet and library resources you will research a grain gathering the following information:

- Where the grain originated and where it is grown today? Is it grown in Canada? Where?
- What it looks like and how it is grown and harvested
- Market forms and where it is typically purchased
- How it is prepared for consumption (typical cooking methods and recipes)
- Its nutritional value

2. You must also find a recipe that will be used for the rest of the class to sample the grain. The recipe and a grocery list must be submitted on _____ (date).

Please have the recipe approved by the teacher before writing it out.

3. You will prepare the recipe on _____ (date).

4. Your information and recipe must be presented on a poster that will be presented to the class along with the recipe you have prepared for sampling on _____ (date).

CRITERIA FOR ASSESSMENT:

Grains –Recipe Poster and Preparation	Marks
Grain_____	/60
Group members – participation equal	/5
Neat, colourful poster	/5
Name and origin of grain product, uncooked sample	/5
Picture with short descriptions of how plant is grown, nutrient content, how transformed and distributed in/to Canada	/10
Shopping list	/5
Recipe ingredients and instructions on poster	/5
Recipe preparation and sampling station	/25

Sailing into the Unknown – RECORD SHEET Name: _____

As you view each of the posters and sample each of the products fill in the following chart:

Name of Grain	Where it is grown	What it looks like	Nutritional Value	Name of Recipe	What it tastes like

Follow up suggestions:

GROWING WHEAT GRASS SEED

• Typically wheat grass is used for making Wheat Grass Juice. A juicer is required once plants are ready for preparation (adding apples and carrots can make a more palatable juice choice).

To Make Wheat Grass Juice:

Wash and cut or cut and wash ingredients. Start with some apples. When the juicer foams up, run a few carrots through to clear it out. Repeat until all the apples are juiced. Feed the grass into the juicer, using carrots again to clear it out if necessary. It is recommended that the juice be drunk as soon as it is made.
• If you do not have a juicer, you may want to make arrangements to plant the wheat grass outside and let it mature. You can then use it for next year's class and dried flower arrangements.

OTHER PRACTICAL ACTIVITIES/LABS

• You might consider doing a Breakfast Cereal Comparison. Oats work well. Have students prepare regular oats, fast cooking oatmeal, instant oatmeal and Cheerios™ for cost, taste, cooking time, and nutrition.

• In addition to Museli you could have students make Granola and do follow up recipes for example, Granola Bars or Granola Cookies.

• The dough from a half recipe of Whole Grain Buns can be used for a Whole Grain Pizza crust.

• Depending on the recipes chosen by students in the research assignment, you could have students prepare salad or side dish recipes using whole grains.

FIELD TRIPS

- Trip to Prince Rupert or Vancouver grain terminal to see first-hand the process of exporting from the continent.
- Farm visit to observe fields of grain or the harvesting of grain.
- Arrange a trip to a local bakery.

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