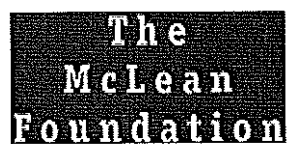


# Apples of British Columbia

Prepared by Doreen van Stolk  
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And  
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Summer Institute 2004 was sponsored by:



## Summer Institute for Educators

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

Participants (20 educators from Kindergarten to Grade 12) spend one week at the Montfort House Rural Resource Centre situated on UBC's Farm 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, tuition, meals 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 web site at [www.aitc.ca/bc](http://www.aitc.ca/bc) or directly at the AITC office. Contact Lindsay Babineau at 604-556-3088 for an application form.

## Core funding for BC Agriculture in the Classroom Foundation's Summer Institute for Educators 2004 was provided by:

- The Beef Cattle Industry Development Fund

## Teacher sponsorship was provided by:

Fraser Valley Cole Crop Growers' Association  
Fraser Valley Strawberry Growers' Association  
BC Chicken Growers' Association  
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Bevo Farms  
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**British Columbia Agriculture in the Classroom Foundation**

**A Teacher Resource for Food Studies**

# ABC - Apples of British Columbia

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## ABC - Apples of British Columbia

### OVERVIEW

This resource demonstrates how you can take one food product grown in British Columbia and use it to explore what David Gruenewald (2003)<sup>1</sup> calls “the study of place (and)...reeducating people in the art of living well where they are.”

Increasingly those concerned with food, whether it be food production or consumption, are realizing the essential connections between personal health, sustainable agriculture and the health of the planet. The advantages of choosing local products grown close to home are numerous. Just to name a few:

- Food grown close to home is easier on the environment as fewer resources are used for transportation.
- Locally grown food is fresher and generally has not lost nutrients due to early harvest and traveling for weeks to get here.
- Because it is fresher, locally grown foods have more taste.
- Purchasing locally grown foods supports farmers in BC to continue to produce food.
- Supporting local farmers ensures that the agricultural land will be preserved and available for food production in the future.

Apples are the most important tree fruit crop in Canada, and the fourth most important worldwide after all citrus fruits, grapes and bananas.

Apple production has a long history in BC. Tree fruits were introduced to B.C. by the early settlers with seed they carried with them from Fort Vancouver as they explored the interior. By the 1850s there were plantings of small orchards in the Fraser Valley. A fellow named Thomas G. Earl established the first orchard at Lytton. Cold winters forced Earl out of business, but other growers, including an Oblate missionary named Father Pandosy, had discovered the Okanagan Valley, an area boasting a warmer, although much drier, climate. Pandosy planted his first trees where the City of Kelowna now stands. Dry soil proved a barrier to production until growers rigged pumps and open flumes to direct water from lakes and creeks into the Valley.

BC produces about 30% of the apples grown in Canada. Today, about 98% of BC apples are produced in the Okanagan-Similkameen valleys. The hot dry weather is ideally suited to growing Red and Golden Delicious apples. High sunlight and temperature levels are ideal for apple colouring and yield. The low rainfall level reduces the impact of disease. Most orchards are on slopes near lakes which moderates the temperatures and reduces the risk of winter injury and spring frost. Apples are also grown on Vancouver Island, the Fraser Valley and Kootenay areas.

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<sup>1</sup> Gruenewald, David A. (2003). The Best of Both Worlds: A Critical Pedagogy of Place Educational Researcher, Vol. 32, Nov.4, pp. 3-12.

Since apples are so plentiful and such an important crop in terms of agricultural production in British Columbia, this fruit lends itself well to an in depth examination of our relationship with food.

This resource package contains:

- An example of how some of the activities were put together in a unit plan for Food Studies 11/12
- Teaching activities related to apples and agriculture in BC
- Recipes for classroom teachers that use apples to meet the learning outcomes of the Food Studies 11/2 IRP
- A Resource List for those teachers who want further information and teaching materials

## ABC - Apples of British Columbia

### Doreen's Unit Plan

There are many activities in this resource for teachers to choose from. Doreen teaches Food Studies as a combined 11/12 class in Chilliwack. She has only one week to spend on an apple unit. So this is her unit outline and the activities she chose.

	Topic	Objective	Teaching Activity	Resources Required	Possible Follow up
Day 1	Introduction to Agriculture in BC	SWBAT: <ul style="list-style-type: none"> <li>•identify the areas of the province where most of the food is grown</li> <li>•identify the foods grown closest to where they live</li> </ul>	<ul style="list-style-type: none"> <li>•Introduction to Agriculture in BC</li> <li>•Local Food Supply Student Handout</li> </ul>	<ul style="list-style-type: none"> <li>•Agriculture Fish &amp; Food in British Columbia Map Poster</li> <li>•What Does It Take to Produce Food Poster</li> </ul>	<ul style="list-style-type: none"> <li>•field trip to local orchard, farmers market, food production plant</li> <li>•self guided field trip</li> </ul>
Day 2	Demo and Lab on Apple Pie Filling	SWBAT: <ul style="list-style-type: none"> <li>•demonstrate understanding of the cookery principles related to fruit cookery and preservation</li> </ul>	<ul style="list-style-type: none"> <li>•THE EARTH AS AN APPLE</li> <li>•demonstration of recipe Apple Pie Filling</li> <li>•student lab – Apple Pie Filling</li> </ul>	<ul style="list-style-type: none"> <li>•Apples and the other pie filling ingredients.</li> <li>•Equipment such as cutting boards, paring knives, etc.</li> </ul>	<ul style="list-style-type: none"> <li>•Apple Research Assignment</li> </ul>
Day 3	Mass Production of Food Video + Grow BC Apple Information	SWBAT: <ul style="list-style-type: none"> <li>•explain how and why food is processed</li> <li>•apple production &amp; processing in BC</li> </ul>	<ul style="list-style-type: none"> <li>•Mass Production of Food Video</li> <li>• Questions from Grow BC</li> </ul>	<ul style="list-style-type: none"> <li>•video</li> <li>•Grow BC</li> </ul>	<ul style="list-style-type: none"> <li>•Applesauce Factory</li> <li>•Behind the Label</li> <li>•field trip or guest speaker</li> </ul>
Day 4	BC Apple Tasting	SWBAT: <ul style="list-style-type: none"> <li>•name and describe apples grown in BC</li> </ul>	<ul style="list-style-type: none"> <li>• BC Apple Tasting</li> </ul>	<ul style="list-style-type: none"> <li>•1 or 2 apples of each variety</li> </ul>	<ul style="list-style-type: none"> <li>•Apple Research Assignment</li> </ul>
Day 5	Lab Apple Breakfast Bar	SWBAT: <ul style="list-style-type: none"> <li>•demonstrate how to prepare a food product that has apples as an ingredient</li> </ul>	<ul style="list-style-type: none"> <li>•demonstration of Apple Breakfast Bar</li> <li>•student lab – Apple Breakfast Bar</li> </ul>	<ul style="list-style-type: none"> <li>• enough ingredients so students can make recipe in pairs</li> </ul>	

## **ABC - Apples of British Columbia**

### **IRP (Curriculum) Connections For Doreen's Unit**

Doreen used this unit to meet the following learning outcomes prescribed in the Food Studies 11 and 12 Integrated Resource Packages (IRP) the mandated curriculum provided the Ministry of Education in British Columbia

#### **Curriculum Organizer - PREPARATION PRINCIPLES**

Learning Outcomes

##### **Grade 11**

- Demonstrate an understanding of cooking principles (cooking of pie filling)
- Explain and use basic food-related terminology (peeling, slicing, preservation)

##### **Grade 12**

- Apply an understanding of cooking principles (microwave cookery principles, thickening agents)
- Use advanced food-preparation terminology (prevention of oxidation, gelatinization)

#### **Curriculum Organizer - PREPARATION TECHNIQUES**

Learning Outcomes

##### **Grade 11**

- Demonstrate a variety of food preparation techniques (microwave, baking, freezing)
- Demonstrate the appropriate use of basic food-preparation equipment (apple corer, microwave)

##### **Grade 12**

- Make proficient use of a wide range of food-preparation techniques (sugar solution, thickeners)
- Assess new technologies available for food preparation (food processor vs paring or chef's knife; microwave vs conventional stove top cooking; and juicer)
- Adapt ingredients and methods to create original recipes (Apple bar-reducing fat/increasing fibre)

#### **Curriculum Organizer - NUTRITIONAL ISSUES**

Learning Outcomes

##### **Grade 11**

- Identify the food sources of nutrients (nutritional value of apples)

**Grade 12**

- Critique the production, composition, and consumption of commercial food products (compare commercial vs home made apple pie filling)

**Curriculum Organizer - SOCIAL AND ECONOMIC ISSUES**

## Learning Outcomes

**Grade 11**

- Identify environmental and health issues related to the production and consumption of food (change in apple production to reduce pesticides)
- Analyze the effect of food marketing practices on consumer behavior (explain the effect of buying BC apples versus imports)
- Identify factors that affect the food supply (weather, pests, workers, and demand)
- Identify career opportunities in the food industry (Mass Production Video)

**Grade 12**

- Evaluate career opportunities in the food industry (Mass Production Video + BC Tree fruit website)
- Critique global environmental and health issues related to the production and consumption of food (advantages in buying local – less use of fossil fuels in transportation; nutritional advantages of eating fresh versus processed foods)

## **Doreen's Narrative Account of Implementing the Unit**

I began this semester with an overview of Agriculture in the classroom materials. I used six copies of the poster Agriculture in BC so that I could divide the students into groups to see the food that our Province produces. I then had the students focus on what is grown in the Fraser Valley, especially in and around Chilliwack as that is where I teach. Each unit supplied a list of food grown locally. I asked students to name farms in the area, and also name the food outlets in the community from which they bought food. We then focused on stores in town that sold fresh, local produce. I used an exercise (Local Farms + Food) that students answered and handed in for marking. I followed this with questions taken directly from an Agriculture in the Classroom *Growing Places* issue. I received the poster "What does it take to produce food?" and used it to start the discussion on food production. I put the questions on an overhead.

After completing the above activities I began the Apple Unit. I've been lucky enough to have students supply the lab with donated apples in the past few years and this year was no exception! Many students had toured a local apple farm in Primary grades and have an understanding of what an apple orchard looks like.

I used the donated apples to prepare the recipes included in my one week outline. For the Apple Tasting sheet I used apples that were grown locally at an apple farm. Watch for seasonal information on apples. This year, for example, Save-On Foods published information on Apples in the October sale flyer. No conclusion could be drawn over which apple was a favorite; many received an equal vote! I mark all of the students labs and worksheets. I have included additional facts/web-sites which *could* be used in the people search section and have a trivia assignment that counts for 10% of the term grade that I have included. The apple trivia would only count for part of this assignment. For teachers in the lower mainland I recommend that you try to attend the annual B.C. Apple Festival at the Botanical Garden at UBC in October.

### **Reflection**

I was pleased with all aspects of the unit plan. I am semestered (one linear class) so I teach and accomplish a great deal in one class. From an informal vote I discovered 'apples' to be a favorite food of students. The varieties eaten vary greatly! B.C. does a great job of producing many different apples (heritage etc). I would like to expand the unit with more activities and look forward to purchasing and using the FUTURE ADDITIONS as listed below. February used to be APPLE MONTH in B.C. I hope to receive my new videos in time for second semester. I am fortunate to teach a course where I can incorporate Agriculture in the Classroom Activities in all of my units!

### **Future Additions**

I would like to investigate using the following videos: Broken Limbs, the Sustainability Roadshow, and Bitter Harvest.

I would like to create a lesson or webquest using [www.bctree.com](http://www.bctree.com) for Nutritional data, Apple serving Tips, Storage and Handling, Washing Fruit, Portion Cost and Apple Techno and Facts, [www.bcfg.com](http://www.bcfg.com) for Apple 'trivia', [www.5to10aday.com](http://www.5to10aday.com) for nutritional information and <http://infobasket.gov.bc.ca/portal/server.pt>, <http://www.agf.gov.bc.ca/aboutind/products/> and [www.agr.gc.ca](http://www.agr.gc.ca) for production information.

I would also like to attend UBC Apple Festival in October.

**ABC - Apples of British Columbia  
Teaching Activities**

**THE EARTH AS AN APPLE**

While cutting and paring (peeling) the apple for a demonstration lesson so the following:

- Slice the apple into quarters and set three quarters aside.

**Explanation:** These three quarters represent the oceans of the world. The fourth quarter represents the total land remaining.

- Slice the remaining quarter in half, providing two  $1/8^{\text{th}}$  pieces. Set aside one of the  $1/8^{\text{th}}$  pieces.

**Explanation:** This piece represents the land that is too inhospitable for human use – the polar area, deserts, swamps, high altitudes, steep mountainous areas. The remaining  $1/8^{\text{th}}$  piece represents the land where people LIVE....not necessarily where the food is grown, but where people live.

- Slice the remaining  $1/8^{\text{th}}$  piece into four sections. You will now have four pieces, each representing  $1/32^{\text{nd}}$  of the earth. Set aside three of the four pieces.

**Explanation:** These 3 pieces represent areas that are too rocky, too wet, too cold, too steep, areas with soil that is of limited quality for food production and urbanized areas. The remaining  $1/32^{\text{nd}}$  represents the land currently used for agricultural production.

- Peel this  $1/32^{\text{nd}}$  and hold up the peel.

**Explanation:** This tiny bit of peel represents the surface – the very thin skin of the earth’s crust upon which humankind depends. Usually less than five foot deep, it represents the fixed amount of land that is used for food production.

**Source:** UPDATE Number 38, Spring 2000 (Ontario Agri-Food Education publication) [www.oafe.org](http://www.oafe.org)

**Sample Discussion Questions:**

- Why is it important to preserve this land?
- What has been done in BC to preserve farmland?
- What should be done to preserve farmland?
- What are the consequences of not preserving farmland?
- What kind of action can you as an individual take to preserve farmland?
- What types of agriculture are there in our community?
- Where can you buy locally produced foods?

**ABC - Apples of British Columbia  
Teaching Activities**

**Introduction to Agriculture in BC**

This is an introductory activity that is aimed at introducing students to the diversity of food products grown or raised in BC.

**Objective:** students will be more aware of local food production

**Materials:**

Several copies of:

- Agriculture Fish & Food in British Columbia Map Poster
- What Does It Take to Produce Food Poster

(both available from Agriculture in the Classroom Foundation, see resource list)

Class set of Local Food Supply Student Handout

**Directions:**

1. Hand out one copy of the Agriculture Fish & Food in British Columbia Map to each unit or group (if you are unable to get copies of the map you can photocopy p. 9 in GROW BC – it is best if it is darkened and enlarged).
2. Have students study the map and lead a discussion using the following questions as starters:
  - What foods are grown in the area where we live? Are there any foods produced here that you were unaware of? Are there foods produced here that are not mentioned on the map? What could account for that? What makes this area suitable for producing the foods shown on the map?
  - What part of BC produces the majority of the food? What are the reasons for this? Where does the majority of the population in BC live? What problems can result?
  - Could we be well nourished if we just ate food produced in BC? Explain.
  - What are the advantages of choosing foods produced in BC?
  - Since our main topic is Apples, where are apples produced in BC?
3. Hand out one copy of What Does It Take to Produce Food poster to each group.
4. Have the students study the poster and lead a discussion using the following questions as starters:
  - What kinds of knowledge and skills are required? How would they be obtained?
  - A local farmer refers to plants and animals as energy converters? What does he mean?
  - Why are air and water so important to the food supply?
  - What ways are used to enrich the soil with nutrients?
  - Give some examples of the plants, animals, birds, and fish that are used for food in BC.
  - What are the various names of people who produce food? (e.g., orchardists, vintners, cattle ranchers, poultry producers, dairy farmers, etc.
  - What kinds of technological advances can you expect to find on today's farms?
5. Hand out Local Food Supply question sheet and have students complete.

### Local Food Supply

Objective: To gather information about local food production.

In your group discuss the following and (individually) record the answer.

1. Name the farms growing or producing food in this area:
  
  
  
  
  
  
  
  
  
  
2. List as many foods as possible that grow or are produced here (hint: you can include your own garden):
  
  
  
  
  
  
  
  
  
  
3. Make a list of local food production that is seasonal and that which occurs year round?

Seasonal	Year Round

4. What local foods are available right now?
  
  
  
  
  
  
  
  
  
  
5. Are there any food processing plants in our community? Describe.

6. Have you ever worked harvesting, processing or selling fresh locally grown/produced food? Describe.
  
7. List the places that sell locally grown food products:
  
8. Are there places where you can buy direct from the farmer or producer? List.  
What is the advantage of buying direct from the farmer or producer?
  
9. Are there any farmers or producers who do “value added” processing in order to sell their product? Describe.
  
10. Are there any farmers or producers who have other commercial ventures on their property in order to bring in additional income? Describe. (Hint – different forms of agri-tourism would count).
  
11. List all the advantages of buying locally.

**ABC - Apples of British Columbia  
Teaching Activities**

**Mass Production of Food Video**

This video shows how the following foods are produced: Jam, Pasta, Curries, sauces, mixes, soups, meat, chocolate products, candy, and coffee. There is a section on prepackaged Apples that highlights growing, harvesting, and processing apples. You may choose to show the whole video (60 min.) or just the section on apple processing.

**Objective:** students will be more aware of how food is transformed into a diversity of products and the careers involved

**Materials:**

Mass Production of Food video available from Classroom Video (see resource list)  
Class set of Mass Production of Food Video Student Handout.

**Directions:**

1. Introduce the lesson by having students do a brainstorming session naming all the products that are made from apples. Ask students “What does it takes to transform an apple into these products? How is that done?”
2. Hand out the Mass Production of Food Video Student Handouts.
3. Have students fill in the top 2 questions:

What do you already **know** about mass production of food?

Some prompts – What does it mean? What does it involve? Where does it take place? Who/what does the work?

What do you **wonder** about mass production of food?

Some prompts – What questions do you have about the mass production of food?  
Are there things you would like to know more about? What things? Why?

Then introduce the video and go through the questions on the apple section on student handout so they know what to watch for as they view the video.

4. After the viewing, have students complete the last section, What did you learn about the mass production of food? And discuss the questions in the “wonder” section that were not answered in the video.

**Possible Follow Up**

1. The Applesauce Factory simulated activity in *The Food System: Building Youth Awareness through Involvement* (see resource list) explores careers in food transformation.
2. Have students research the various careers involved in mass food production: product development, food scientists, food packaging engineer, label designer, sales representative, food microbiologist, food producer, assembly line engineer, quality assurance, publicity and branding, sensory evaluation specialist, etc.
3. See Behind the Label – It Takes a Food System to Produce Food.
4. See teaching suggestions that come with the video.
5. Consider a field trip to a local food processing plant or a guest speaker from the food production industry.

## Mass Production of Food Video

What do you already know about the mass production of food?

What do you wonder about mass production of food?

As you view the video pay particular attention to the section where they show the mass production of prepackaged apples and answer the following:

1. Apples are washed to remove \_\_\_\_\_.
2. Which sorting is done by machine? C \_\_\_\_\_.
3. What does ergonomic hand packing mean? \_\_\_\_\_  
\_\_\_\_\_.
4. Why is water a good way to move the fruit? \_\_\_\_\_  
\_\_\_\_\_.
5. Why is grading of apples done? \_\_\_\_\_  
How is it done? \_\_\_\_\_.
6. How are the prepackaged apples preserved (kept fresh)? \_\_\_\_\_  
\_\_\_\_\_.

What did you learn about the mass production of food?

## **ABC - Apples of British Columbia Teaching Activities**

### **APPLE FACTS FROM "GROW BC"**

This activity focuses specifically on apple production and use in BC. It refers to p. 74 and p. 75 of "Grow BC" a publication from Agriculture in the Classroom Foundation at was sent to every school in BC and should be available in your library. If not see the resource list for ordering information.

**Objective:** to review basic information related to apple production in BC.

#### **Materials:**

- Photocopies of p. 74 and 75 of "Grow BC" for the students to use as a reference. One each or one reference for two students. (Doreen made an overhead for students to use as a reference. This is another possibility.)
- Class set of student handout, APPLE FACTS FROM "GROW BC"

#### **Directions:**

1. You may want to begin with the Apple People Search as an introduction to general information about Apples and then move on to assigning the questions related to "Grow BC".
2. You may go through the answers orally, extending the information or collect the question sheet for marking.

### **ANSWER KEYS**

#### **Mass Production video**

1. residues/dirt
2. culling
3. no strain on the body of workers (pickers/packers)
4. no bruising
5. for appearance – color, size, best fruit for eating, rest for processing
6. waxing, cool temp storage, controlled atmosphere

#### **Grow BC Apple Questions p. 74 & 75**

1. apples
2. pome core
3. 98 % Okanagan - Similkameen Valley Fraser Valley Kootenay
4. 26
5. Two-thirds eaten
6. Energy pectin digestive
7. Fresh processed
8. pasteurized
9. high-density planting, growing varieties that are more popular in international markets
10. see "Who's involved in producing apples?" p. 75

**APPLE FACTS FROM "GROW BC" 20**

USE p. 74-75 of GROW BC TO ANSWER THE FOLLOWING

1. The most valuable horticulture crop in BC is \_\_\_\_\_.
2. An apple is a \_\_\_\_\_ fruit, as is a pear. The seeds are protected in the \_\_\_\_\_.
3. \_\_\_\_\_% of BC apples are grown in the \_\_\_\_\_. The rest are grown in the \_\_\_\_\_ and \_\_\_\_\_ areas.
4. BC produces \_\_\_\_\_% of the apples grown in Canada.
5. \_\_\_\_-\_\_\_\_\_ (fraction) of the apples grown are \_\_\_\_\_ as fresh fruit.
6. Apples are a source of instant \_\_\_\_\_. They are a source of \_\_\_\_\_, a soluble fibre which helps clean the \_\_\_\_\_ system.
7. Two-thirds of the apple crop is sold \_\_\_\_\_. One-third of the crop is \_\_\_\_\_. Apple juice is the most popular form of \_\_\_\_\_ apples.
8. To kill harmful bacteria, the juice is \_\_\_\_\_.
9. Two things that fruit growers have done to modernize their orchards and make them more competitive are  
\_\_\_\_\_  
\_\_\_\_\_
10. List 4 names of careers that are involved in producing apples?  
\_\_\_\_\_  
\_\_\_\_\_

**ABC - Apples of British Columbia  
Teaching Activities**

**APPLE PEOPLE SEARCH**

This is an introductory activity that is aimed at introducing students to a unit on apples. It is an interactive sharing of information among students. It could be preceded with having students in table groups completing a web or mind map of all the information they know about apples. If you are short of time the apple information can be used as "trivia" in and during lessons (see Doreen's narrative).

Objective: students will be more aware of apple related information (e.g., nutrition, cookery principles, consumer issues and production).

**Materials:**

One set of apple information strips.

Class set of Apple People Search Handout

Apples for prizes (optional)

**Directions:**

1. Photocopy the information about apples and cut into strips, one for each student.
2. As students enter the class they are each handed an information strip and an Apple People Search Handout. Students are directed to find the information to fill in the Apple People Search Handout from each other, to record the answer in the box and to get the signature of the person who provided the answer. Teacher can decide whether the students must get every box filled or whether to divide the class into 5 groups and assign them a column (column A covers nutrition related information; the first P column covers food preparation and cookery information; the second P column covers consumer information; the L column highlights production facts; and the E column is apple trivia). Teacher can also decide whether all students have to get all the information assigned or whether to stop and debrief after the first person is finished (similar to bingo). Teacher can also decide whether to provide prizes (apples) to those first finished.
3. Possible debriefing activities.
  - If you have preceded this activity with the apple webbing activity mentioned above then the students could add the information from their Apple People Search to their webs.
  - The columns could be assigned to groups to summarize or to extend with further research.

**ABC - Apples of British Columbia  
Teaching Activities**

**APPLE PEOPLE SEARCH – Information strips**

Apples are about 12% natural sugar or fructose. Fructose is a water-soluble sugar found in all ripe fruit. Because of the solubility of fructose, the body does not have to convert it into sugar before use, therefore, making apples a source of instant energy.

Apples are a delicious source of dietary fiber and pectin that helps aid digestion and promotes weight loss and can lower bad LDL cholesterol and help raise good HDL cholesterol.

Most apples are picked by hand.

The science of apple growing is called pomology.

25 percent of an apple's volume is air. That is why they float.

A medium apple contains about 80 calories.

Apples ripen six to ten times faster at room temperature than if they were refrigerated.

BC is pioneering Sterile Insect Release (SIR) technology for one of the world's worst apple and pear pests - the codling moth.

Apples come in all shades of reds, greens and yellows.

It takes about one kilogram of apples make one large pie.

There are over 7500 varieties of apples are grown throughout the world.

Apples crunch when eaten because they are composed of tiny cells filled with water and when you bit into an apple, those cells explode into a loud crunch because apple cell walls are strong.

Appearance, color, maturity, size, shape and quality are the determining factors for Canada Extra Fancy (the top grade for fresh eating), Canada Fancy and Canada Commercial (ideal for cooking) grades. Grading ensures that the apples have met federal government standards.

Ethylene gas is produced as apples mature. Ethylene can speed ripening of pears, bananas, peaches and plums. Add an apple to a bag of these fruits if they are still on the green side to hasten ripening.

Some apples may be sprayed with a thin coating of edible wax to improve their appearance and increase their shelf life.

Canadian apples are now exported to more than 20 countries with the major importers being the United States and the United Kingdom.

Johnny Appleseed was a real person. His name was John Chapman. He was born in Leominster, Massachusetts, September 26, 1774.

Apples are the most valuable edible horticulture crop in BC. About 75% of all BC orchard land is planted in apples. BC produces about 30% of the apples grown in Canada.

The Spartan apple was developed at the Research Station in Summerland, B.C. while the new variety Ambrosia originated from Cawston, B.C.

Apples contain naturally occurring antioxidants called flavonoids, which may reduce the risk of heart disease and inhibit the development of certain cancers, particularly lung and colon cancer.

In recipes calling for white wine, you can substitute apple juice.

Coat apple slices with ascorbic acid or lemon juice to prevent browning.

Applesauce can be used as a substitute for butter in a recipe. Replace half of the butter with applesauce to reduce the fat and add great flavor and nutrients.

The average North American eats between 5 and 6 kilograms of fresh apple per year, which is only about two large apples per month.

**APPLE PEOPLE SEARCH**

Find the person who can share the information with you. Put the answer on the space provided and have the person sign on the line to verify that you got the information from them.

A	P	P	L	E
<p>Naturally occurring anti-oxidants in apples which may reduce the risk of heart disease and cancer are called _____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>What can be used as a substitute for butter in a recipe to reduce the fat and add flavor and nutrients?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>How many kilograms of fresh apples does the average North American eat?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>What countries are the main importers of Canadian apples?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>How many varieties of apples are there grown throughout the world?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>
<p>Explain why apples are a good source of instant energy.</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>What is used to prevent apple slices from browning?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>Explain why it is important to store apples in a cool place.</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>The science of apple growing is called _____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>Why do apples float?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>
<p>The main mineral and vitamin found in apples are _____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>In recipes, you can substitute apple juice for _____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>Name the three main shades of apples.</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>What is SIR and what it is used for?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>Why do apples crunch?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>
<p>Apples contain _____ that helps aid digestion and promotes weight loss.</p> <p>_____</p> <p>(name of person with this information)</p>	<p>The gas released by maturing apples that hastens the ripening of other fruits is _____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>What is used to improve the appearance of apples and increase their shelf life?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>BC accounts for what percentage of the Canadian apple crop?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>Who was Johnny Appleseed?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>
<p>How many calories in a medium apple?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>To make a large pie buy _____kg apples.</p> <p>_____</p> <p>(name of person with this information)</p>	<p>Name the 3 grades of apples.</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>How are apples harvested?</p> <p>_____</p> <p>_____</p> <p>(name of person with this information)</p>	<p>Two apples developed in BC. are _____</p> <p>_____</p> <p>(name of person with this information)</p>

information)	this information)			this information)
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**ABC - Apples of British Columbia  
Teaching Activities**

**BC APPLE TASTING**

This is an awareness and consumer comparison activity that is aimed at introducing students the variety of apples that are grown in BC. It involves comparing and contrasting various apples according to colour, shape, taste and texture.

- Objective:**
- students will be able to identify and name apples grown in BC
  - students will be able to evaluate apples based on taste, texture, price

**Materials:**

- Several varieties of apples grown in BC. One or two apples of each variety depending on the method of sampling used. (When you purchase them make sure you record the price.)
- Class set of BC Apple Tasting Handout

**Directions:**

1. If there is only one apple of each variety then gather the students so they can see and show each apple in turn discussing the colour and shape and sharing the price so that students can fill in those columns in the chart. Drawing the shape rather than describing it often works well. Then cut the apple in half so that students can determine the interior colour and fill it in (try to get them to be specific, e.g., white with a green tinge, creamy or yellowish). Lastly cut the apple into small pieces so that each student can sample and describe the taste and texture.
2. If you have more than one of each apple then the students can be assigned the task of setting up a station with one whole apple, one apple cut into pieces for sampling and then students can rotate from station to station filling in the BC Apple Tasting handout.

**Possible follow up**

- discuss the common uses of the various apples, e.g., Golden Delicious is an excellent all round cooking apple, a Jonathon holds its shape well so is good for open faced tarts and pies, McIntosh tends to break down when cooked, so it's best suited for double-crust pies, cobblers, and crisps, Spartan is well suited to sauce, pies and baking as well as fresh eating, Fuji is suited for making applesauce or eating raw, Gala's are great for salads or as an 'out-of-hand' snack, Red Delicious is favoured for fresh eating. Or use the Apple Research Assignment.
- have students investigate what apples are available in their community at the various grocery outlets, farmers' markets, farm gates. This could be done using the Local Food Supply question sheet.
- students could determine the miles traveled if one purchased a Granny Smith grown in New Zealand. (An apple grown in New Zealand travels approximately 12, 000 more kilometers to reach us than an apple grown locally, resulting in more than 50 times the amount of environmental harmful CO<sub>2</sub> emissions.)

**BC APPLE TASTING**

Compare each of the apples provided according to exterior colour, shape, and flesh colour. Then sample a small piece of each and describe the flavour and texture.

VARIETY	COST PER KG	EXTERIOR COLOUR	SHAPE	FLESH COLOUR	FLAVOUR AND TEXTURE

Which of these apples have you tasted before? \_\_\_\_\_

What apple did you like best? \_\_\_\_\_

***Did you know?***

- Canadians eat more bananas than apples. We do not grow bananas.
- The Okanagan region of the province produces more than 96% of the tree-fruit crops grown in the province.
- British Columbia apples are exported to more than 30 countries.

*Find out:*

- What heritage apples are and how they relate to biodiversity.

**ABC - Apples of British Columbia  
Teaching Activities**

**APPLE JUICE TASTE TEST AND CONSUMER COMPARISON**

This is an awareness and consumer comparison activity that is aimed at introducing students the variations available for a single consumer food item. The goal is to have them think critically about how they spend their consumer dollar and to be able to defend the choice they make.

**Objective:**

- students will be able to use criteria to evaluate a food product
- students will be able to give reasons to support purchasing food products made locally

**Materials:**

Several examples of apple juice – tetra pack, frozen, bottled – made in BC, imported – organic, etc. (when you purchase make sure you record the price)  
Class set of Apple Juice Taste Test and Consumer Comparison handout.  
Glasses or Dixie Cups for each student for sampling.

**Directions:**

1. Set up stations each (or have students set up the stations and pour out samples) with a different apple juice. Go over directions for the sampling with the students. Set up parameters on how much is appropriate for a sample to ensure that each student get a sample. Remind students of the type of information they are looking for, for each column of the student handout.

**Suggestions discussion:**

Which of the juices were pasteurized? Why is this important?  
How much juice is required to make a serving according the Canada's Guide to Healthy Eating? (100-125 ml) Why is this such a small amount?  
Were any of the samples organic? What does this mean?  
What other information on the label?  
What juices were produced in BC?

**Possible Follow Up:**

- Consider bringing in someone who has a juice extractor to demonstrate the process.
- A field trip to a local production facility where “value” is added to locally produced food.
- Do the Behind the Label activity.

**APPLE JUICE TASTE TEST AND CONSUMER COMPARISON**

Take a small portion of each of the apple juices available and fill in the following chart.

Brand Name	Where It Is Produced?	Type of Packaging	List of Ingredients	How it is prepared?	What is the price per ml?	Describe the Taste and Colour

- Which brand of apple juice did you prefer for taste? \_\_\_\_\_  
 Explain why. \_\_\_\_\_
- Which brand of apple juice did you prefer for colour? \_\_\_\_\_  
 Explain why. \_\_\_\_\_
- From an environmental point of view, which brand do you think is best? (consider the way it was produced, the amount of packaging, whether the packaging can be recycled, the amount of energy used in production, transportation, and storage, etc.)  
 \_\_\_\_\_ Explain why. \_\_\_\_\_
- Which brand is the best buy considering price? \_\_\_\_\_
- What are the advantages of drinking locally (B.C.) produced apple juice rather than orange juice or apple juice from other places?

### Apple Research Assignment

There are many varieties of apples each with their own history, taste, and uses. Your task is to research one apple variety and prepare a report that includes information on:

- the origin of this particular variety
- where it is commonly grown
- a description – colour, shape, texture, taste
- common uses (eating, cooking, juicing, etc.)
- other interesting facts about this variety

Choose from:

**AMBROSIA**  
**BRAEBORN**  
**CORTLAND**  
**CRISPIN (MUTSU)**  
**DUCHESS**  
**ELKAMINE**  
**ELSTAR**  
**EMPIRE**  
**FUJI**  
**GOLDEN DELICIOUS**  
**GRANNY SMITH**  
**GRAVENSTEIN**  
**HYSLOP**  
**JONAGOLD**  
**JONATHAN**  
**LIBERTY**  
**LODI**  
**MCINTOSH**

**MILTON**  
**MUTSU**  
**NEWTOWN**  
**NORTHERN SPY**  
**RED DELICIOUS**  
**RED ROME/ROME BEAUTY**  
**ROYAL GALA**  
**SHAMROCK**  
**SILKEN**  
**SINTA**  
**SPARTAN**  
**SUMAC**  
**SUNRISE**  
**TYDEMAN**  
**YELLOW TRANSPARENT**  
**YORK**  
**WEALTHY**  
**WINESAP**

## ABC - Apples of British Columbia Teaching Activities

### The Food System Behind the Label<sup>1</sup>

This activity involves introducing students to the complexity of food production. It asks them to speculate on all the aspects of the food system that are involved in bringing a food item to the consumer.

**Objective:** • students will be able to list all the components of the food system and describe what is involved in each component for one food product.

**Materials:**

- several items (the actual item or the wrapper, label, package) that are made from apples, (e.g., apple juice, apple pie filling, dried apple slices, apple leather, apple sauce. One item could be a fresh apple.)
- a class set of **The Food System Behind the Label Student Handout**

**Directions:**

1. Introduce the topic of the day by having students think of words that include system (e.g., school system, digestive system, sound system, ecosystem, etc.). Discuss what makes a system. The definition of a system could be put on the overhead or board: **an interdependent group of components forming a unified whole.** Ask students “what are the interdependent components of the food system?” The following flowchart could be put on an overhead or the board:

**Natural and Human Resources --> (work with) inputs --> (to) produce food -->**

**(which is) transformed --> (for) distribution --> (made) accessible --> consumed -->**

**(leaving) outputs --> (that may become) natural resources (to start the cycle again).**

2. Have students work in small groups. Give each group one of the products containing apples. Give each person or each group a Behind the Label Student Handout and have the students answer the questions for their particular product either on a separate piece of paper or a poster.

3. Students could then report back to the class their results and a class discussion could follow with these discussion starters:

- The food system is very complex, what would happen if one part of the system didn't function, or if there was a breakdown in one part? e.g. the inputs (no water), the food production part (crop wiped out by disease), the distribution part (cost of fuel goes up), farmer can't make enough from the crop, etc.
- There are outputs throughout the system, did you include these in your output section?
- Can any of the outputs become natural resources that can be returned to the system?
- What kinds of careers are involved in each component of the system?
- Did you realize that eating an apple connects you to so many people?

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<sup>1</sup> Modified from Food System Label Guide in *The Food System: Building Youth Awareness through Involvement*.

## The Food System Behind the Label

Examine closely the food product you have been given and answer the following questions on a separate paper or poster. Make your answers as detailed as possible.

### INPUTS

What inputs were necessary in order to produce this food item? (energy, labour, fields, soil, water, machinery, equipment, etc.)



### FOOD PRODUCTION

How was the food grown, raised, harvested? Where might it have been grown and raised? What is required to do this?



### FOOD TRANSFORMATION

Is your food processed? How was this done? Were additional ingredients required? Is your food packaged? What kind of material is used? What is involved in the packaging?



### DISTRIBUTION

How might the food have been transported from where it was grown to where it was transformed to where it was purchased? What kinds of resources were required to do this?



### FOOD ACCESS

Where are you most likely to purchase this product? Can most people afford this product?



### CONSUMPTION

Can this food be consumed as is, or does it need more processing or preparation? What kinds of resources are involved?



### OUTPUTS

What is left once this food is consumed (e.g., packaging, peels, seeds, waste)? How is what is left disposed?

**APPLE PIE FILLING** (Freezer)

Yield: 4 individual size pies  
Microwave HIGH Total: 5 mins

1 KG Apples  
200 mL sugar + 10 mL Fruit Fresh  
30 mL minute tapioca + 50 mL sugar + 10 mL cinnamon

1. Peel and Core apples. Slice into 12 OR cut into apple donuts.
2. Combine apple slices with 200 mL sugar and Fruit Fresh in a large casserole dish. Let stand 5 minutes
3. Cook apples on high for 3 minutes. Stir in tapioca mixture. Cook 2 minutes, or until apples are clear.
4. Chill quickly by placing casserole dish in a cold water bath – stir often. Seal in freezer containers or labeled freezer bags.

**APPLE BREAKFAST BAR** (source: [www.bctree.com/recipes/apple](http://www.bctree.com/recipes/apple))

125 mL flour	30 mL butter
2 mL salt	1 L apples, peeled, cored and sliced
2 mL baking soda	French Vanilla yogurt for topping
80 mL brown sugar	
250 mL rolled oats	
125 mL butter	

1. Preheat oven to 350 F. Grease a small square cake pan.
2. In a mixing bowl combine the first 6 ingredients.
3. Cut in butter with a pastry cutter.
4. Spread half of the crumb mixture into the bottom of a greased small square pan.
5. Cover with apples and top with the remaining crumbs.
6. Dot with the remaining 30 mL of butter.
7. Bake 40 minutes.
8. Cut into squares and serve warm with the yogurt.

## Resource List

### ***Apple Network*** - <http://www.bcapples.com/applenetwork.html>

This website connects you to where apples are grown in BC. There is a useful section on recipes and health information and several excellent links to general BC apple industry sites.

### ***Agriculture in the Classroom Foundation***

A source of a wealth of information, materials, posters, teaching plans, videos, posters (mostly free) for all grades. Of particular interest:

- **Agriculture Fish & Food in British Columbia Map**, poster (free)
- **What Does It Take to Produce Food**, poster (free)
- **“Grow BC”**, book (\$18.95 plus shipping and handling but there should be a copy in your school as one was sent to every school in BC. Check with your school librarian)
- **Feeding Frenzy, Put Your Money Where Your Mouth Is, and The Sustainability Road Show**, videos (\$19.95 each plus shipping and handling)
- **Think Global, Eat Local**, unit plan for senior Food Studies Classes (free)
- **Promise in the Land: Sustaining our Agriculture** (1990), a video on agriculture in BC that can be borrowed.

Visit the website for further information: [www.aitc.ca](http://www.aitc.ca)

### ***BC Fruit Growers Association*** - [www.bcfga.com](http://www.bcfga.com)

This website has extensive information such as apple history, core facts, nutrition and recipes, apple trivia, profile of an apple breeder.

### ***BC Tree Fruits Limited*** - <http://www.bctree.com>

This website has many sections but the fruit information and recipes would be the most useful.

### ***BC Ministry of Agriculture and Lands***

This ministry maintains two websites that have information on food grown and produced in the province.

<http://www.agf.gov.bc.ca/aboutind/products>

<http://infobasket.gov.bc.ca/portal/server.pt>

### ***Broken Limbs: Apples, Agriculture and the new American Farmer*** (video, 2004).

Purchasing information [www.brokenlimbs.org](http://www.brokenlimbs.org). It explains how a family apple business finds ways to diversity and survive as a business. It is American but BC apple growers are facing the same problem. The website also has a downloadable teachers guide with discussion questions and activities such as the Buy Local Challenge and Dissecting an Apple Pie.

### ***Five to Ten a Day Campaign*** - [www.5to10aday.com](http://www.5to10aday.com)

This website is a collaboration of the Heart and Stroke Foundation, the Canadian Cancer Society and the Canadian Produce Marketing Association. The goal is to encourage

Canadians to consume more fruits and vegetables. A good source of information on the health benefits of fruits and vegetables.

***The Food System: Building Youth Awareness through Involvement***, A guidebook for educators, parents and community leaders. Written by Alison Harmon, Rance Harmon, and Audrey Maretzki. This is an excellent teacher resource. It has several great activities all laid out and teacher ready. The Applesauce Factory outlines how to make applesauce factory style with each student in the class taking on a role (e.g., product development director, sensory evaluation specialist, principal food scientist, nutritionist, sales representative, etc.), is a great activity to teach the food transformation process and careers in the food industry. Order from: Audrey Maretzki, Professor of Food Science and Nutrition, Food Science Dept., Pennsylvania State University, University Park, PS 16802

***Mass Production of Food*** (Video, 1998), This video shows how the following foods are produced: Jam, Pasta, Curries, sauces, mixes, soups, meat, chocolate products, candy, and coffee. There is a section on prepackaged Apples that highlights growing, harvesting, and processing apples. It is available from Classroom Video, #107-1500 Hartley Ave, Coquitlam, BC V3K 7A1, Tel:604 523 6677, Tollfree:1 800 665 4121, Fax:604 523 6688, Free Fax: 800 665 2909, [orders@classroomvideo.co](mailto:orders@classroomvideo.co) (cost \$84.00)

***New Variety Development Council*** - <http://www.bcapples.com/>

This website describes new varieties of apples and has a section on apples recipes and health information.

***North Okanagan Fruit Growers*** - <http://www.bcfruit.com>

This site has a section on apple facts and other information related to growers of fruit in this area.

***Sunrype Products Ltd.*** - <http://www.sunrype.ca/nutrition.asp>

The Applewise section of this website is particularly useful.

***Treasures from Our Trees*** (1995), a teaching resource of the Tree Fruit Industry of British Columbia, written by Sharon McCoubrey. It is more elementary but many of the activities could be adapted for junior and senior high. Available from Sharon McCoubrey, UBC Okanagan, 3333 College Way, Kelowna, BC, V1V 1V7 or BC Fruit Growers Association, 1-800-619-9022, [www.bcfga.com](http://www.bcfga.com)