TIPS•FOR•TOURS

Greenhouse Tour Tips For

TEACHERS

BC Agriculture in the Classroom Foundation
bcaitc.ca

BC GREENHOUSE GROWERS' ASSOCIATION

This document has been compiled by the
British Columbia Agriculture in the Classroom Foundation

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in cooperation with:

British Columbia Greenhouse Growers' Association

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Why Choose a Farm for a Field Trip?

Farm Tour Topics

A farm tour provides the opportunity to raise awareness of the role of agriculture and food production in our daily lives.

Agriculture is a business that affects all of us within our communities. During the course of a tour students can begin to understand the multifaceted role of a farmer: in the stewardship of the land, stewardship of resources, the safe use of machinery and technology and in the interactive role within the community.

Some of the topics that can be introduced are the:

- history of farming, the farm family, how farming has changed, challenges and joys of farming, the farm lifestyle;
- importance of agriculture in providing diverse career opportunities;
- top quality products BC agriculture has to offer, the types of foods produced and the process by which they reach the consumer;
- costs of farming-how a tractor compares to a car, the cost of farmland compared to a house
- relationship of greenhouse crops to the food and food products we use daily;
- insects and chemicals both natural and artificial; their use and handling; costs and alternatives;
- safety standards for workers and for food handling;
- weather and seasons - impacts on farm and production
- problem solving and innovations;
- the variety of crops; products derived from the farm; differences and similarities to field crops
- the role technology has in improving the safety and quality of agriculture and the products it produces.
- the many diverse employment opportunities in the greenhouse industry
- the trail of farm to table – how does food move?
- techniques used to market farm products, including packaging, advertisement, and social media

Seeing, breathing and experiencing farming helps all of us see how we are connected to the most basic of all things-food.

Types of Farms

Choosing a Farm

Not all farms are created equal. Some farms may have more emphasis on one subject area than another. Time of year or season will also affect what you see and the availability of staff to assist you in answering your questions.

To determine which type of farm and the best time of year to visit review the following:

FARM TYPE	WHAT YOU MAY SEE	FARM AVAILABILITY
DAIRY FARM	Wide range of activities both plant and animal. Use of technology e.g. computers, machinery and a systems approach (milking equipment).	Best time is in Winter.
FRUIT AND VEGETABLE GROWERS	Product on the vine, tree, root. Machinery in use. Some may have a processing plant on-farm.	In Fall during harvest is best but availability may be limited.
SHEEP FARM	Life cycle, animal care, feeding will be highlights. Machinery or technology may not be highly visible although computers will be used for accounting/records.	Spring - (March/April) after lambing.
GOAT FARM (DAIRY)	Similar to a dairy cow operation but with goats. Some may have a processing plant in close proximity to goat operation.	Winter is best.
GREENHOUSE FLOWERS	Check with grower.	
GREENHOUSE VEGETABLES	Check with grower.	Fall or early Spring during or after harvest.

TIP: For a list of farm tour locations please visit BC Agriculture in the Classroom at www.bcaitc.ca

New BC Curriculum Connections

GRADE	SUBJECT	CONTENT CONNECTION
KINDER	Science	- Basic needs of animals - Living things make changes to accommodate daily and seasonal changes
	Social Studies	- Relationship between the community and environment
GRADE 1	Science	- Names of local animals - Behavioural adaptations of animals in the local environment
	Social Studies	- Relationship between the community and environment
GRADE 2	Science	- Similarities and differences between offspring and parent - Water sources including local watersheds - Water conservation and the water cycle
	Social Studies	- Diverse features of the environment - Relationship between the community and environment - Aspects of life shared across cultures (family, holidays, food, etc.)
GRADE 3	Science	- Biodiversity in the local environment
	Careers	- Connections to the community
GRADE 4	Science	- Sensing and responding to humans, environment,
GRADE 5	Science	- Basic structures and functions of body systems - Interconnectedness with the environment
GRADE 6	Science	- Basic structures and functions of body systems
	Physical and Health Education (PHE)	- Practices to promote health and well-being; influences on food choices
	Social Studies	- Urbanization and migration of people - Economic policies and resource management - Globalization and trade
GRADE 7	Science	- Organisms have evolved over time - Survival needs
	Social Studies	- Human responses to particular geographic challenges and opportunities
	Careers	- Local and global needs and opportunities - Life and career planning

New BC Curriculum Connections

GRADE	SUBJECT	CONTENT CONNECTION
GRADE 8	Science	- Characteristics of life - Relationship of microorganisms with living things
	Social Studies	- Human responses to particular geographic challenges and opportunities, including climate, landforms and natural resources
	Applied Design, Skills and Technologies (ADST)	- Food Studies → social factors that influence food choices; variety of eating practices; local food systems - Entrepreneurship/Marketing → role of entrepreneurship in designing and making products/services (branding, pricing, record keeping); difference between consumer wants and needs
GRADE 9	Science	- Sexual reproduction - Matter cycles within biotic and abiotic components of ecosystems
	Applied Design, Skills and Technologies (ADST)	- Food Studies → ethical issues related to food systems - Entrepreneurship/Marketing → flow of goods and services from producer to consumer; identification of a good/service
	Careers	- Factors affecting types of jobs in the community
GRADE 10	Sciences	- DNA structure and function - Patterns of inheritance - Applied genetics and ethical considerations
	Applied Design, Skills and Technologies (ADST)	- Food Studies → simple and complex global food systems; causes and consequences of food contamination outbreaks - Culinary Arts → locally available food products
GRADE 11	Sciences	- Human actions and their impact on ecosystem integrity - Resource stewardship - Water distribution has a major influence on weather and climate - Levels of biotic diversity
	Social Studies	- Global agriculture practices - Demographic patterns of growth, decline and movement
	Applied Design, Skills and Technologies (ADST)	- Food Studies → issues involved with food security; factors involved in the creation of food guides/labelling - Culinary Arts → BC agriculture practices
GRADE 12	Sciences	- Organ systems structure and function/interdependence - DNA/ gene expression - Land use, degradation and management - Conservation of water
	Social Studies	- Global agricultural practices

Planning and Arranging a Tour

Link the Farm Tour with the Classroom Studies

- Use videos and Agriculture in the Classroom materials to give students some insights as to what they may see during the visit.
- Find out if anyone has a family member who farms. Get them to share their experiences.
- Review *Grow BC at* www.bcaitc.ca to become familiar with the different types of farm productions.
- Have the students prepare some questions ahead of time.
- Worksheet for bus ride-spotting items on the way to the farm that relate to agriculture.

Prior to the Tour

- ❑ Book the bus or arrange carpooling.
- ❑ Permission slips sent, returned and signed by parent or guardians prior to the event.
- ❑ Visit the farm and go over the tour plan if possible.
- ❑ Arrange for volunteer supervisors.
- ❑ Complete *Information Sharing Form* in this package.
- ❑ Bring all required equipment-camera, video, note pads, pencils, first aid kit.

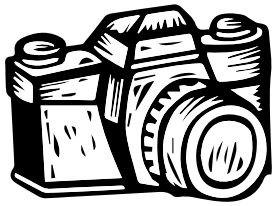
Last Minute Reminders

- Wear easy to clean warm clothes and wear waterproof footwear for wet weather.
- Use washroom facilities before you leave the school.
- Bring water and a snack or lunch if needed.

Planning and Arranging a Tour

During the Visit

- Class supervision is necessary during the entire visit. **Ensure that parents agree to stay focused on the tour at all times. The farm tour is educational and not a time to socialize.**
- Follow the farmer's rules for biosecurity (i.e. stepping in a foot bath).
- Follow the farmer's rules for your safety around machinery, equipment and structures. Remember the farm is a working farm and like any manufacturing workplace dangers are possible.
- Stay on the main paths and do not enter the areas that are blocked off. These areas could offer potential hazards.
- Avoid sudden movements, pulling strings or containers. These can potentially create dangers for you reducing production for the farmer.
- Students or teacher/supervisor may want to collect memories.



1. Take pictures for school displays. Remember some pictures, drawings or stories written by the children may be appreciated by the farmer too.
2. Record audio/video: must have permission to film farm premises.

Planning and Arranging a Tour

What to do After the Visit

- Create a board game with issues and dangers concerning the farmer's operation.
- Create a model of the farm/greenhouse.
- Consider entering agriculture models and issues in Science Fairs.
- Chronicle a week in the life of a farmer.
- Compile a catalogue of (greenhouse vegetable) products or create a sales flyer advertising things a farmer might need.
- Collect recipes for a veggie cookbook. Try one of the recipes with the class.
- Compose a song about the farm or product produced on the farm visiting, e.g. update and rewrite, "Old MacDonald's Farm".
- Collect and compare the prices of vegetables grown in BC and in other parts of the world. Compare the journeys of fruit and veggies grown in BC to produce from outside of Canada – how does a artichoke and a BC pepper reach the grocery store?
- Find out how many famous stories, riddles, sayings have farm terms in them, e.g. Jack and the Beanstalk; "Don't cry over spilt milk".
- Examine the role of pollinators in the greenhouse.
- Explore specific careers in the greenhouse such as IPM specialist.
- Examine the role of beneficial insects in the greenhouse.
- Research one career you learned about at the greenhouse – what schooling/training does it need?
- Design your own greenhouse garden and make a model to display.
- "Tasting" Centre – do a greenhouse vegetable taste test.
    1. Compare peppers, tomatoes, cucumbers, lettuce…
    2. Have children taste each sample and record their comments.
    3. Graph results.
    4. Have a selection of many different product cartons/ packaging - talk about all the people involved to get the product to market.

TIP: Use BC Agriculture in the Classroom Resources to help extend your learning!

Information Sharing Form

Teacher to Farmer - for the teacher to fill out.

Before the Tour

- Pre-Visit the farm and go over tour plan if possible
- Provide list of participants
- Arrangement of specific activities or achievement of specific goals

Things the Farmer Needs to Know

Teachers name _____

School name _____

Contact number _____

Age level of the group _____

Number of children and supervisors (does not include one teacher per class) _____

Children Supervisors

Recommended ratios of children to adults:

Primary (K-Grade 3): 6 children to 1 adult
Intermediate (Grade 4-7): 10 children to 1 adult
Secondary (Grade 8-12): supervisors if any children with special needs or behaviour challenges

Topics the teacher would like introduced _____

If there are any special needs children (eg. wheel chair accessibility) or children with allergies (eg. hay allergies)

_____

What are the hours, days or months that the visit is preferred _____

Farmer to Teacher - for the farmer to fill out.

Things the teacher needs to know

Name of farm _____

Contact name _____

Contact number _____

Type of farm _____

What specific limitations are there (eg. they must be gone by 2 pm end of shift) _____

Appropriate clothing (eg. closed tow shoes, no flip flops, no heals, etc.) _____

Restriction on group sizes. If they will need to be divided into supervised smaller groups _____

Any monetary charges for visit or for snacks _____

Contract required: Yes ❑ No ❑

Location of the farm

- Provide a map with a clearly marked route. Indicate distance from the school.
- The type of parking facilities and distance to the assembly area. Is there capacity fro cars (carpooling) or buses.
- Where to assemble upon arrival

Let's Begin Your Greenhouse Tour

Questions to Explore in the Greenhouse

Elementary

The Boiler Room and Heat

- Carbon Dioxide is needed for plants to grow. How does the boiler give carbon dioxide to plants?

Irrigation - Hydroponics

- How does the water get to the plants?
- What are rockwool blocks?
- What are coir blocks?

Growing in the Greenhouse

- What are the jobs in the greenhouse
- How is the temperature controlled in the greenhouse to help plants grow?

Good Insects and Bad Insects

Integrated Pest Management (IPM)

- Name some bad insects that eat plants.
- Name some good insects that eat pests.

Greenhouse vegetables

- Name some vegetables grown in a greenhouse.

Intermediate/ Senior

The Boiler Room and Heating

- What is the boiler used for in the greenhouse?
- What do plants use carbon dioxide for?
- How does the reuse of carbon dioxide reduce the impacts of climate change?
- What specific ways does the greenhouse producer act as a steward of our environment?

Irrigation - Hydroponics

- Where does the water come from in the greenhouse to feed the plants?
- For nutrient cycles, how does the hydroponic system model renewable and green practices?
- How does the hydroponic system model renewable and green practices?
- Compare a rockwool block and a coir block

Let's Begin Your Greenhouse Tour

Questions to Explore in the Greenhouse

Intermediate/ Senior cont'd

Growing in the Greenhouse

- Outline the growth cycle of a greenhouse plant from seed to harvest
- Outline how plants in the greenhouse environment grow, transpire, and respond to stimuli such as light
- Outline the growth cycle of a greenhouse plant
- Compare greenhouse and field grown systems

Technology in the Greenhouse

- How can a greenhouse producer support the local and or global community?
- How does technology play a role in greenhouse operations
- Outline two ways technology and sustainability work together for environmental stewardship.

Good Insects and Bad Insects

Integrated Pest Management (IPM)

- Identify a good and bad pest in a greenhouse environment
- How does IPM help a farmer have a healthy crop

Grading Packing and Marketing

- What type of market segment does the greenhouse industry fill?
- What demands are BC greenhouses able to meet?
- Why is BC able to compete in a North American market?
- What might be some concerns for BC greenhouse producers in marketing their products?
- What are the concerns for Greenhouse Growers during free trade negotiations?
- How is price determined for greenhouse vegetables?

Evaluation Form

Please fill out this evaluation for the farm tour you participated in today. Thank you.
Send completed form to: _____

This program increased my students understanding and appreciation of agriculture and farming.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

This program helped my students understand where their food comes from and/or gain an understanding of how food is produced.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

This program is a valuable curricular-linked learning experience for my students.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

I will use the resources provided to me from the tour.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

I would recommend this tour to another school/teacher.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

I would consider taking part in another farm tour in the future.

Strongly Disagree ❑ Disagree ❑ Neutral ❑ Agree ❑ Strongly Agree ❑

Please provide feedback on the tour, presenter, resources, or other elements you have identified that you would like to see AITC address for the future:

School Name: _____ Farm Name: _____

Teacher Name: _____ Farm Contact: _____

Number/Grade of students: _____ Type of tour (circle one) dairy, ranch, greenhouse

Glossary

BC Agriculture in the Classroom Foundation

A non-profit, charitable organization that works with educators to bring local agriculture to BC's students. Together with farmers, teachers, and agriculture specialists, BCAITC teaches students about the story of our food in British Columbia. Through programs, students learn about where their food comes from, how to grow their own food, and why farms and agriculture play such an important role in our communities and society.

BC Greenhouse Growers' Assoication

Represents greenhouse vegetable farmers in British Columbia. Growers produce 96 percent of all of B.C.'s greenhouse vegetable production. The BC Greenhouse Growers' Association is committed to delivering services and research programs to its members to help keep them globally competitive and to keep a vibrant and sustainable greenhouse vegetable sector in B.C., while providing high-quality and safe greenhouse vegetables to consumers. Greenhouse growers are the farmers for British Columbia's 21st Century who grow world-class products in harmony with the environment.

Bell Peppers

Plump crisp and hollow, this variety of sweet pepper is cultivated for its fruits ranging in colours including red, yellow, orange, green, white, and purple. Botanically speaking, bell peppers are fruits; however, they are considered vegetables in culinary contexts. In the greenhouse, bell peppers are also planted into plugs, transplanted and pruned to maximize fruit production. The fruit will ripen 6 to 9 weeks after the fruit forms (depending on the time of year). Peppers are harvested when the fruit is at 85% of full colour.

Carbon Cycles

Carbon cycles through the environment as follows:

- CO_2 is removed from the atmosphere by photosynthetic plants and stored in the plant tissue
- CO_2 is returned to the atmosphere via respiration in all living organisms.
- CO_2 is one of the inputs of photosynthesis and as such CO_2 plays an important role in increasing crop productivity.

Climate Change

A change in global or regional climate patterns, in particular a change apparent from the mid to late 20th century onwards and attributed to many factors, including industrialization.

Glossary

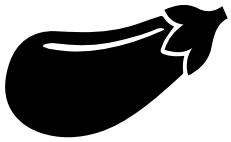
Coir

A type of growing medium in hydroponics that does not to provide nutrients, but allows the plant roots to grow in a moist environment. It takes the place of soil, so the roots can support the plants weight and hold it upright.

Cucumbers

It is possible to grow 1 - 4 crops of greenhouse cucumbers a year. Cucumbers are very sensitive to environmental factors so care must be taken at all stages of growth. Seeds are planted in plugs, transplanted carefully to protect their fragile roots, fertilized and watered. A mature cucumber plant can use 4L of water per day. Excess leaf growth is pruned to encourage fruits to form. Cucumber vines are trained to grow up support wires. Cucumber harvest starts in 2 to 3 weeks after planting.

Eggplant



The large egg-shaped fruit is from an Old World plant, eaten as a vegetable. Its skin is typically dark purple, but the skin of certain cultivated varieties is white or yellow. In the greenhouse the eggplant seedling will have three to four true leaves by the time they are ready to be transplanted. About four square feet per plant is the required greenhouse spacing and is the same production space that is used for tomato plants. By the time the plants are a foot tall, they should be supported in their vertical position with vine twine.

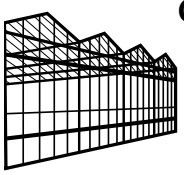
Environmental Stewardship

Use resources efficiently to reduce waste and minimize on the negative impacts on the environment. Translate reduced consumption and waste into financial savings. Provide a healthy, more efficient and effective working environment.

Field Grown Vegetable

Field vegetable production is dependent on practices that provide well drained soils, adequate irrigation and good fertilization. Careful management is necessary for pest control.

Greenhouse



Is a building covered in glass, plastic or fibreglass. Temperature, ventilation, humidity, light, water and carbon dioxide can all be increased or decreased to produce the best possible greenhouse growing environment.

Hydroponics

Is a cultivation method of growing plants without soil by using mineral nutrient solutions in a water solvent. The plant is supported by materials such as coir or rockwool.

Integrated Pest Management, or IPM

Is a system that supports a balanced approach to suppressing pests in an effective, economical and environmentally sound way. Use of predator bugs to manage plant damaging insect and biological pest controls ensure a virtually pesticide free environment. For example, we use lady bugs for control, has a big appetite for eating pests that threaten our produce. We use a variety of other 'good' bugs.

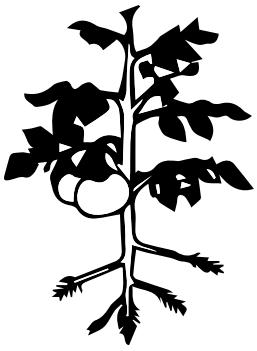
Nutrient Cycling

Is one of the most important processes that occur in an ecosystem. The nutrient cycle describes the use, movement, and recycling of nutrients in the environment. Valuable elements such as carbon, oxygen, hydrogen, phosphorus, and nitrogen are essential to life and must be recycled in order for organisms to exist. Nutrient cycles are inclusive of both living and non-living components and involve biological, geological, and chemical processes. For this reason, these nutrient circuits are known as biogeochemical cycles.

Photosynthesis

Green plants use sunlight to synthesize foods from carbon dioxide and water. Photosynthesis in plants generally involves the green pigment chlorophyll and generates oxygen as a byproduct.

Parts of a Plant



Fruit is the sweet and fleshy product of a plant that contains seed and can be eaten as food.

Leaf is green in colour filled with chlorophyll.

Flower produces a fruit, with seed.

Seed from a plant, capable of developing into another plant.

Root takes in water and food from the irrigation water, and anchors the plant.

Stem transports water and nutrients through the plant, like a straw that supports the leaves and fruit.

Respiration

The process of the plant which uses the sugars made in photosynthesis to make energy, with the byproduct of CO_2

Rockwool

is one of the most common growing media's used in hydroponics. Rockwool is a sterile, porous, non-degradable medium that is composed primarily of granite and/or limestone which is super-heated and melted, then spun into a small threads like cotton candy. The rockwool is then formed into blocks, sheets, cubes, slabs, or flocking. Rockwool sucks up water easily so you'll want to be careful not to let it become saturated, or it could suffocate your plants roots, as well as lead to stem rot and root rot.

Transpiration

The process of plants taking up water through their roots and "sweating" it through their leaves. It helps the plant to stay cool.

Tomatoes

are also called "vining" tomatoes. They will grow and produce fruit until killed by frost and can reach heights of up to 10 feet although 6 feet is considered the norm. They will bloom, set new fruit and ripen fruit all at the same time throughout the growing season.

USMCA
United States Mexico Canada Agreement

Is an agreement among the United States, Canada and Mexico that replaced the North American Free Trade Agreement (NAFTA) in September of 2018. It promotes free trade between the three nations without a government applying tariffs, subsidies, or prohibitions on goods and services. USMCA is also referred to as CUSMA and New NAFTA.

Support Materials

Support Materials available from:

British Columbia Agriculture in the Classroom
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www.bcaitc.ca

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