



AN EXPLORATION OF DRY BEAN FARMING



**TEACHER'S GUIDE
GRADES 5-10**

About This Resource

This Teacher Guide was designed with the support of and in collaboration with the Ontario Bean Growers.

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Cover Photo: VanTol Cranberry Bean Field, Credit: Jennifer Mitchell, Wellington County, July 2020

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AN OVERVIEW OF DRY BEAN FARMING

Grades 5-10

WHAT ARE BEANS?

Beans are considered “pulses” which are members of the *legume* family of plants. Legumes refer to the plants whose fruit is enclosed in a pod, while pulses are a subgroup of legumes and refer to the edible, dried seeds of certain legumes. The word “pulse” comes from the Latin *puls* which means “thick soup, potage”. Pulses have been an essential part of the human diet for centuries. The agricultural production of beans, chickpeas and lentils dates back to 7000-8000 BCE.¹ Ontario is one of Canada’s major producers of dry beans with 85%-90% of Ontario’s beans being exported to other areas of the world while the rest are sold and used right here in Canada. The dry, edible beans grown in Ontario include the following varieties:



Adzuki Beans

A unique variety of beans, these are used mainly as a confectionary item in Asian cuisine. Most Ontario Adzuki Beans are exported to Japanese markets.



White Pea Beans

Also known as Navy Beans, these are the most popular edible bean crop grown in Ontario. Most Ontario White Pea Beans are exported to the United Kingdom for use as Baked Beans. Some are sent other markets in Italy or New Zealand or remain in Canada.



Black Turtle Beans

Also known as Black Beans or Pretos, these have a nut-like flavour and are popular in Caribbean, Mexican and South American cuisine. Most Ontario Black Beans are exported to Mexico.



Dark Red Kidney Beans

Great in soups, casseroles, chilis or salads, they are a popular bean in both Canada and abroad and grown primarily in Ontario and Manitoba. Like navy beans, most dark red kidney beans are exported to the United Kingdom.



Light Red Kidney Beans

These beans have a great texture for use in salads, casseroles and other Mexican-style recipes. Most of Ontario’s Light Red Kidney beans are exported to the United States, Australia and Portugal.



White Kidney Beans

Also known as Cannellini or Alubia Beans, they make a great, low-fat base when mashed for dips and spreads. Most of Ontario’s White Kidney Bean exports head to the United Kingdom and the United States.



Otebo Beans

A specialty class of bean that is also exported to Japanese markets for use in confectionary pastes.



Small Red Beans

Also known as Mexican Red Beans, these are popular in Caribbean and Central American cuisine and most often eaten with rice dishes.



Cranberry Beans

Also known as Romano or Speckled Sugar Beans, these are very popular in Italian cuisine and a wonderful addition to chili and other favourite bean dishes. Of all the beans, Cranberry Beans have the highest levels of folate. Most of Ontario’s Cranberry Beans are exported to Italy.

Great Northern Beans, Pinto Beans & Yellow Beans

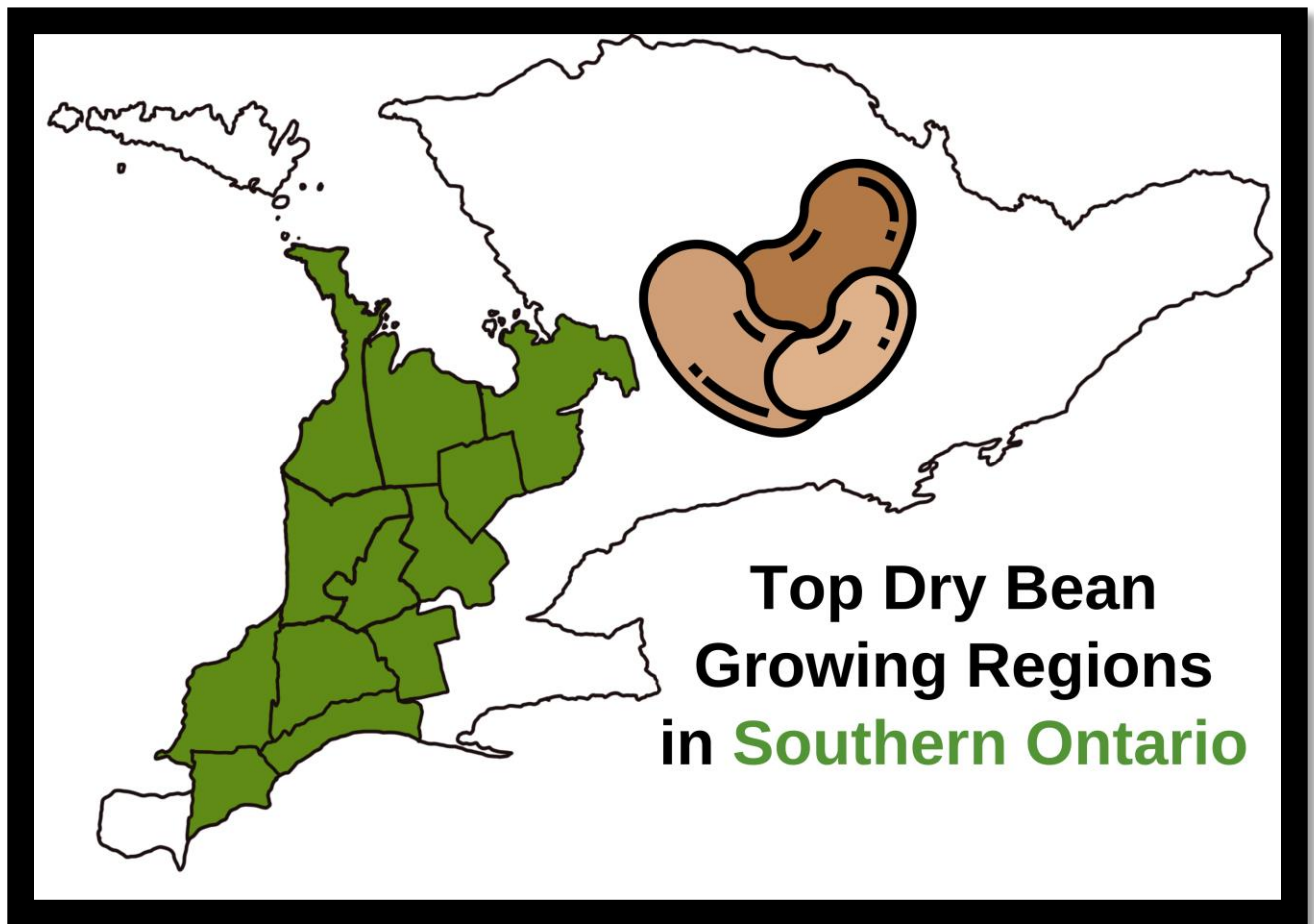


Also grown in Canada, but not typically in Ontario.

WHERE ARE THE DRY BEAN FARMS IN ONTARIO?

Pulses grown in Canada make up a multi-billion dollar industry, with it being the fifth largest crop overall after wheat, canola, corn and barley, making the country the world leader in the pulse trade.

Today, in Ontario, the dry, edible bean industry involves approximately 1000 farmers who work/harvest an average of 120 000 acres each year – nearly 5 times the size of Disney World or over 60 000 CFL football fields! Most of Ontario's dry, edible beans are grown in the corridor of farmland that runs between the Harrow/Windsor Region and the Ottawa Valley.



WHY IS BEAN FARMING IMPORTANT?

Dry bean farming in Ontario is a vibrant and growing industry. Dry beans offer another option for Ontario farmers to include in their crop rotation. They are a high-value crop that, while more difficult and riskier to grow, can be worth the hard work/risk because of positive returns to farmers, when the crop is successful.

Pulses, in general, play a crucial role in addressing global food insecurity and with their diverse nutritional profile, they may also help lead to healthier, more balanced diets. The changing global economic and consumer market trends as well as agricultural benefits to adding pulses into crop rotation encourages farmers to add pulse crops to their repertoire. In 2020, The Food and Agriculture Organization of the United Nations (FAO) pointed out the need to continue exploring the potential of pulse crops to meet their Sustainable Development Goals (SDGs).

NUTRITION & HEALTH

A valuable and affordable protein source, pulses also contain tremendous amounts of micronutrients, dietary fibre, and minerals. They are low in sodium, saturated fat, have a low glycemic index, are gluten and cholesterol free. Pairing pulses with other amino acid sources (e.g. grains – rice, in particular, is an often-used complementary protein source), ensures optimal health benefits will be achieved.

Pulses are rich in bioactive phytochemicals and antioxidants which help fight disease and increase vitality. Pulses can aid in weight-management, reduce contributing factors to heart disease and iron deficiency, support growth and development with high quality protein and contribute positively to those requiring allergen-free diets.³

ENVIRONMENT

Pulses are an important and beneficial cash crop around the world that has the added benefit of being able to help farmers work towards environmental and biodiversity goals. Intercropping with various pulses can increase farm biodiversity and create a healthier landscape for animals, insects, and microorganisms. Pulses generally do not require the same amount of water as other conventional crops do, which allows them to withstand harsher weather and climate conditions while also contributing positively to minimizing the water waste.⁴

“Pulses are a key part of sustainable food production. They are “nitrogen-fixing crop” – meaning that they have the potential to work with soil bacteria to draw nitrogen from the air and store it, so farmers can reduce the amount of nitrogen fertilizer applied to their field. After harvest, pulses leave behind nitrogen-rich crop residue, which can further reduce the amount of fertilizer that farmers need to apply for the next crop.”⁵

Some pulse crops are better at fixing nitrogen than others, but the potential is there. Breeding initiatives and research projects are currently underway to improve this trait so farmers can further reduce the use of nitrogen fertilizer on their farms.

FOOD SECURITY

Pulses are an economically accessible product that can be used in a variety of ways as part of meeting daily nutrition goals. Large and small-scale farmers have the opportunity to eat their product directly, sell it locally, and export it to various domestic and global markets. Certain pulses can effectively grow in harsh, more arid environments, which make it an unexpected ally in regions where dependable income is much-needed.

Pulses have a very long shelf life (months to years) when stored appropriately in air-tight containers. Their nutritional value is maintained during storage which allows for flexibility and tremendously reduced levels of food waste. The ease of access to pulses at global markets gives them the ability to bring strong, nutritional value to all areas and demographics - although because of this, there is growing stigma in some developing countries that view pulses as a “poor man’s protein” which is leading to a shift in consumer preferences and the associated economic and environmental issues that arise from this shift.⁶

HOW ARE DRY BEANS PRODUCED?

From field to fork, much goes into bringing beans to our tables. There is great international demand for the high-quality dry beans grown here and as such, 80-90% of the crop is exported. Some companies have opted to label their dry beans "Product of Ontario" and increasingly, the official "Product of Canada" labels are being found on on dry bean packages in Ontario.

The following resources help explain the processes involved in the growing, harvesting, processing, and marketing of Ontario dried beans.

See Video: **From Field to Fork:** <https://www.youtube.com/watch?v=3-eWdBqq3jg>

See Video: **Packaging Beans:** <https://www.youtube.com/watch?v=lnjESntNvVQ&feature=youtu.be>



Adzuki Beans Credit: Ty Carruthers, Peterborough County, June 2020

FARMING

Dry beans are planted in late May or early June. The growing season for beans is between 90-100 days. They are a finicky crop to care for because they are very vulnerable to pests, weeds, and disease. They are monitored through the growing season by the farmer who keeps track of the health of the plant and works to mitigate risk factors that might damage the crop.

HARVESTING

Farmers aim to harvest their beans in mid-September. Beans are ready to harvest when the plants have turned brown. At that point, the bean seeds will be dry and quite hard.

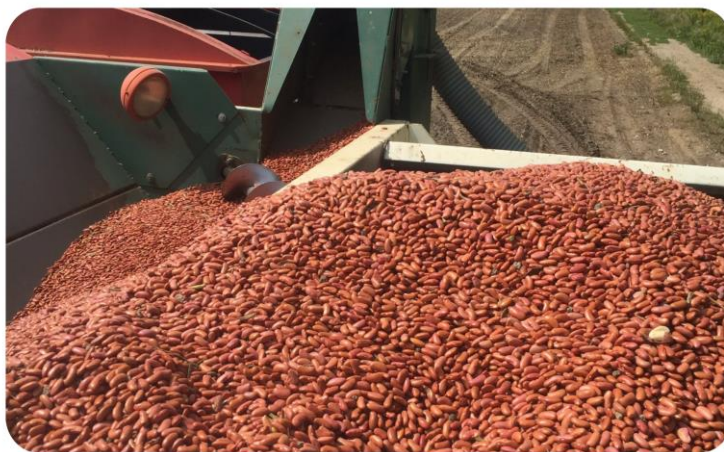
Dry beans are harvested in one of two ways: by pulling/windrowing/combining or by direct harvest.

Large-seeded beans are usually pulled and placed in windrows at harvest.

Pulling refers to cutting the plants 3-5 cm (1.2-2.0 in.) below the soil surface and merging several of the planted rows into a single swath or windrow.

The pods of large-seeded beans tend to be lower to the ground, so this method maximizes the number of pods harvested. Beans are harvested later the same day with an edible bean or conventional combine equipped with a windrow pick-up attachment.

Small-seeded beans, such as white pea beans and black beans, are direct harvested. This means that a combine clips the stem of the plant above the soil's surface and harvests the seeds all in one go.



Light Red Kidney Beans
Credit: Lawrence McLachlan, Middlesex County, September 2020



Hensall Co-op Processing White Pea Beans Credit: Jennifer Mitchell, Huron County, 2018

PROCESSING

Once harvested, the beans are delivered to an elevator by truck. Upon arrival, electronic devices sort, clean and polish the incoming beans. Large, immature, split, discoloured or diseased beans and stones and mud are all discarded in the sorting process. After that, they are stored in large silos ready to be shipped all over the world.

MARKET

100% of the beans grown in Ontario are grown on contract with one of the registered bean dealers. The bean crop is sold before it is even planted. In the contract, the amount and variety of beans as well as any specifications detailing which pesticides/chemicals can be applied and when as well as well is all agreed upon prior to planting. These specifications can also vary depending on which country the beans will eventually be exported to.



Hensall Co-op Beans Prepped for Market Credit: Jennifer Mitchell, Huron County, 2018

WHAT CHALLENGES DO ONTARIO DRY BEAN FARMERS FACE?

ENVIRONMENTAL

While dry beans are nitrogen-fixers and require less water inputs, there is ongoing research being done to continue to innovate and improve farming practices. Researchers are finding new ways to explore the life cycle of beans and how to address environmental concerns. Along with crop rotation and other methods, the use of nitrogen fertilizers is still necessary to maintain soil health and biodiversity balance.



ECONOMICAL

There are many factors that can affect an Ontario bean farmer's ability to provide for their families. As in any agricultural industry, the dry bean industry faces unpredictable seasonal and climate-related concerns. When beans are first planted the plants are extremely vulnerable to sudden weather events. The changing climate also forces farmers to change their practices in order to mitigate and adapt to various long and short-term pressures.

As a result of what is considered a “finicky crop”, bean farmers in Ontario sometimes struggle with finding ways to balance the cost of production with fair market compensation so everyone along the supply chain can make a living. The cost of approved fertilizers and



pesticides can vary depending on seasonal and external regulatory pressures which ultimately adds to the production costs for farmers. Ultimately, growing dry beans can be a great crop for farmers to use in their rotation, but, thanks to these many factors that are often outside the farmer's control, can also be tricky to balance with the farm's overall economics.

SOCIAL

While beans/pulses have been worldwide staples for many years, Canadian consumers are just scraping the surface of the tremendous culinary possibilities these products offer. Increasing the positive discussions around the economic, health and nutritional benefits to including dry beans in the standard Canadian diet aligns with the most recent version of Canada's Food Guide. The guide outlines the need for protein, encourages acquiring it through a variety of sources (meat, legumes, etc.) and points out the health benefits that varied protein sources can offer.⁷ Globally, beans offer a financially accessible source of nutrition to many.

This shift in messaging aligns with what Ontario Bean Growers already know about the nutritional power that beans have. The challenge now is how to convey this message in a way that takes beans from being a back bench food product to becoming a main feature in everyday cuisine.

Bean farmers in Ontario invest a lot of their financial resources into the work of improving and growing their industry. The Ontario-grown bean varieties that are available today are a direct result of farmers investing into the research that goes into selecting the best beans for our growing climate/environment. They invest their own money into learning about ways to adapt to and mitigate risk associated with climate and consumer trends.

Most of the bean farmers in Ontario are family-owned farms who strive to connect with their local communities through various initiatives and are constantly searching for ways to connect with Canadians. Connecting with people is a time-consuming process which can be tricky to balance with the rigors of working on a farm, but partnering with community-based organizations is something farmers strive to do in order to tell their story.



COVID-19

When COVID-19 hit Canada in mid-March, Ontario's dry bean farmers were preparing for their upcoming growing season and were suddenly faced with the reality of border closures and interrupted supply chains. The question of food security became a forefront concern for every Canadian.

While bean farmers faced staffing issues and tech/supply chain interruptions due to the pandemic, they also experienced something very unexpected. For the first time in many years, their storehouses were emptied. As a reliable food for long-term storage, Canadians were buying DRY BEANS in quantities never before seen!

The messaging from the Ontario Bean Growers then shifted to helping Canadians learn how to use the beans they were buying!

Visit www.ontariobeans.ca/recipes to learn how to use your beans!

WHO IS INVOLVED IN THE BEANS/PULSES SUPPLY CHAIN?

From the farmer that works the ground all the way to the consumer, there are MANY people involved in the Canadian dry beans/pulses journey. Along with all three levels of government, there are processors, transportation operators, wholesalers/brokers and retailers involved every step of the way. Here are just a few of the key roles in bringing beans and pulses from farm to table in Ontario:

FARMERS

From preparing the ground, to planting the seeds, to caring for the plants through maturity and harvesting, the farmers are the ones whose hands are in the ground making the magic happen! They also fund the research that goes into producing the best quality seeds for growing in Canada's climate. And on top of everything else, they build and maintain relationships with community partners.



See Video: **From Field to Fork:** <https://www.youtube.com/watch?v=3-eWdBqq3jg>



REGISTERED DIETICIANS & NUTRITIONISTS

Registered Dietitians and Nutritionists are frontline workers who have specialized training in understanding the nutritional components of food and how nutrients work in the human body. When it comes to the bean/pulse industry, these professionals help clients learn how to balance their own diets. They also focus on educating the public about how pulses are a high fibre, low fat protein source that can lead to improved overall health when incorporated properly into a healthy diet.

See Video: **Terri Ney, Registered Dietician** talks about how to incorporate beans into the everyday diet: <https://ontariobeans.on.ca/how-to-videos/>

ECOLOGISTS/RESEARCHERS/UNIVERSITIES

The science behind agriculture is always growing, changing, shifting directions. Farmers and consumers are part of an evolving dialogue that challenges the status quo and encourages new ways of thinking. Research in the areas of environmental stewardship and conservation, climate change and biotechnology has exploded in recent years as partners in agriculture work to ensure healthful, plentiful crops for farmers amidst the numerous environmental and market challenges that are faced by the industry.

In Canada, the University of Guelph, for example, is deeply involved in research in various areas including plant cell biology, molecular biology and genomics.



Learning about various issues crops face that are both disease and development-related can help improve biotechnology methods.

Research Technicians in the Dry Bean Program at the Lethbridge Research & Development Centre are constantly exploring various plant traits to improve bean plant resilience and resistance to pests and disease. Bean Growers from across the country work together to fund the research being done so they might continue to keep up with changing variables that threaten crop health.

VIDEO: Alberta, Canada Bean Plant Science: "The Story of Beans"
<https://www.youtube.com/watch?v=rb8wfbLZfqs>

FOOD SERVICE & CONSUMERS

As consumers work to meet their personal nutrition goals, they are beginning to recognize the value of incorporating more plant-based foods into their everyday culinary creations. The consumer plays an important role in growing an industry and the Ontario dry bean industry is no exception to this. As more Canadians explore how to incorporate beans into their food journeys, the farmers make adjustments to the variety and amounts of beans they grow.

The food service industry – including restaurants, chefs, food stylists, food critics and more – is always innovating and sharing new, exciting ways for consumers to experience foods. Beans and pulses are no exception to this! With more consumers asking for more varied protein options, the food service industry is turning to pulses to expand and optimize balancing how to offer highly nutritious and affordable meals with all of the intense flavours and textures consumers love.

JUST FOR FUN!

Have your students choose one of the many recipes on the Ontario Bean Growers' website and have them work with their families to prepare the recipe and share their experience with their peers via multimedia presentation or video!

<https://ontariobeans.on.ca/recipes/>

TRY COOKING WITH BEANS!

Mexican Black Bean Soup: Chipotle, peppers in adobo sauce make a spicy base for this festive Mexican black bean soup. Loaded with corn, black beans, cooked brown rice and generously topped with diced tomatoes, red onion, sliced avocado, sour cream and cilantro.

Full Recipe: <https://ontariobeans.on.ca/recipe/mexican-black-bean-soup-2/>



Sheet-Pan Moroccan Chicken & Beans: A healthy dinner of chicken thighs, onion, olives, baby potatoes and cranberry beans are seasoned with a blend of Moroccan spices, spread onto one sheet pan and baked for a simpler weeknight meal.

Full Recipe: <https://ontariobeans.on.ca/recipe/sheet-pan-moroccan-chicken-with-beans/>



Mashed White Bean Sandwich: There's a new sandwich in town! Made with a healthy serving of veggies and roughly mashed, nutrient-dense white navy beans, this fibre-rich sandwich will hit the spot at lunchtime!

Full Recipe: <https://ontariobeans.on.ca/recipe/mashed-white-bean-sandwich/>



Cranberry Orange Bean Smoothie: Frozen tart cranberries with tangy orange and white kidney beans make for a thick, creamy and healthy smoothie.

Full Recipe: <https://ontariobeans.on.ca/recipe/cranberry-orange-bean-smoothie/>



Black Bean Brownies: A healthful twist to a tasty, traditional treat! These brownies use black beans to maintain a smooth, rich texture while also adding essential protein and fibre to give these brownies a nutritious boost over their bean-less counterparts!

Full Recipe: <https://ontariobeans.on.ca/recipe/black-bean-brownies/>



LESSON PLAN:

We're Beans for Proteins!



Grades 5-6

ABOUT THIS LESSON

This activity is designed to give students a basic introduction to Ontario's dry bean industry. Students will learn about the nutrition of dried, edible beans and how nutrients can combine to improve overall health and wellbeing. Students will explore how Canada's Food Guide has evolved its understanding of nutrition, how it has grown to include more varied protein sources and will create 3 meals/dishes that include Ontario-grown dry beans, drawing attention to the various nutrients within those dishes.

MATERIALS NEEDED

- Appendix 1A - Handout 1A: **Eat Your Beans!**
- Appendix 1B - Handout 1B: **Be a Bean Chef: The Star of the Show!**
- Appendix 1C - Handout 1C: **Be a Bean Chef: The Co-Star of the Show!**
- Appendix 1D - Handout 1D: **Be a Bean Chef: Beans Behind the Scenes!**
- Appendix 1E - Handout: 1E: **Be a Bean Chef: Checklist for Success**
- Appendix 1F: **Be a Bean Chef: Evaluation Rubric**

CURRICULUM EXPECTATIONS

HEALTH & PHYSICAL EDUCATION

A1. Social-Emotional Learning Skills: Critical & Creative Thinking

*By the end of **Grade 5** & **Grade 6**, students will:*

- A1.6 apply skills that help them think critically and creatively as they participate in learning experiences in health and physical education, in order to support making connections, analyzing, evaluating, problem solving, and decision making.

Plan D2. Healthy Living: Critical & Creative Thinking

*By the end of **Grade 5**, students will*

- D2.1 explain how to use nutrition fact tables and ingredient lists on food labels to make informed choices about healthy and safe foods (**A1.6 Thinking**).
- D3.1 describe how advertising, food marketing and media affect food choices.

*By the end of **Grade 6**, students will:*

- D2.1 apply their knowledge of medical, emotional, practical and societal factors that influence eating habits and food choices to develop personal guidelines for healthier eating (**A1.6 Thinking**).
- D3.1 explain how healthy eating and active living work together to improve a person's overall physical/mental health and wellbeing and how the benefits of both can be promoted to others.

SOCIAL STUDIES

People and Environments: Canada's Interactions with the Global Community

By the end of *Grade 6*, students will:

- B.1 explain the importance of international cooperation in addressing global issues and evaluate the effectiveness of selected actions by Canada and Canadian citizens in the international arena.
- B.3 describe significant aspects of Canada and Canadians in some regions around the world, including impact of this involvement.

SCIENCE

Understanding Life Systems: Human Organ Systems

By the end of *Grade 5* students will:

- 2.3 design and build a model to demonstrate how organs or components of body systems in the human body work and interact with other components.
- 2.4 use appropriate science and technology vocabulary.
- 3.3 identify interrelationships between body systems (*with regard to role of protein*).

VISUAL ARTS

Creating & Presenting

By the end of *Grade 5* & *Grade 6*, students will:

- D1.1 create two-dimensional, three-dimensional and multimedia art works that explore feelings, ideas, and issues from a variety of points of view.
- D1.3 use elements of design in art works to communicate ideas, messages and understandings.

TEACHING AND LEARNING STRATEGIES

Step One: The Basics of Beans & Nutrition – “Build on Prior Knowledge”

Guiding Question: What do you know about BEANS?

Continue the Discussion:

Myths & Misconceptions about the Bean Industry – Explore the following with students. Post each Myth on the board and encourage students to guess the **true facts** behind each statement.

Make it FUN: Turn these into a PowerPoint or use an online app to build an interactive game!

Myth: “Beans don’t have enough protein to replace meat in a meal.”

Fact: Beans have a tremendous amount of the amino acids that make up proteins as well as numerous other nutrients that, when paired with other foods in a balanced diet, contribute to overall health and wellbeing.

MAKE IT FUN!

Bring in several varieties of edible, dried beans that are grown in Ontario to show the students.

See: Overview, page 4 for list of beans.

Let them TOUCH and explore.

Do they know the names of these beans?

Do they have favourite bean-inspired dishes?

Make a **BEAN MOSAIC** or **MANDALA** by gluing colourful beans and other pulses in neat designs on card stock or paper plates.

VIRTUAL LEARNING OPTION: Show students images of Ontario-grown bean varieties and ask the same questions.

Myth: “You MUST combine beans with other foods EVERY time you eat them in order to create complete proteins.”

Fact: While beans are considered “incomplete” protein sources (meaning they lack a full set of amino acids to make up complete proteins), when included throughout the day as **part of a balanced diet** that adheres to the standards set out in Canada’s Food Guide, we are more than covered for the protein that our bodies require.

Myth: Beans are not as filling or satiating as meat.”

Fact: Because of their tremendous amount of dietary fibre in beans, they have the potential to help us feel fuller longer which means beans can offer this vital nutrient on top of their ability to contribute protein and other essential vitamins and minerals to the body!

Myth: Eating beans give you GAS!

Fact: While we’ve all heard the rhyme “*Beans, beans the musical fruit, the more you eat, the more you toot!*”, what the lyricist did NOT tell us is that when beans are included as regular part of our diet, our bodies **adjust** to compensate, which results in less gas over time. There are also some simple things we can do to limit the starch (which is the gas-causing ingredient in beans!): rinse canned beans in water before using them, cook dried beans until they’re soft and do not re-use the cooking liquid in recipes.

“Fun Bean Facts” from the Ontario Bean Growers: <https://ontariobeans.on.ca/all-about-beans/bean-facts/>.

Step Two: Building Bean Nutrition Knowledge

Have students visit The Evolution of Canada’s Food Guide: <https://www.canada.ca/en/health-canada/services/canada-food-guide/about/history-food-guide.html> and the current Canada Food Guide: <https://food-guide.canada.ca/en/>.

Have them break into pairs or work together as a class to compare and contrast how the nutrition information has changed over the years.

Discuss the following questions:

- How do these Food Guides Differ? How have their recommendations changed?
- What has been changed in the 2020 version?
- Why do you think these changes have been made?
- Watch the TVO Kids describe the newest guide: <https://www.youtube.com/watch?v=CsvBBfRDjbg> .

ASK STUDENTS: Why is protein important for overall health? Why do you think *VARIED* sources of protein might be beneficial?

Use <https://www.canada.ca/en/health-canada/services/nutrients/protein.html> to help you answer the questions:

- Certain protein sources have lower saturated fats than others;
- Varied sources of protein offer lower cholesterol options and ensures all of the essential amino acids are incorporated into the diet.

ASK STUDENTS: Why is fibre important for overall health? Use <https://www.canada.ca/en/health-canada/services/nutrients/fibre.html> to help you answer this question.

- Fibre may help with bowel regularity, lowering blood cholesterol levels and help you feel fuller longer.

ASK STUDENTS: What do you think “PULSES” are?

Prior to watching the following two videos, give students **HANDOUT 1A: Eat Your Beans!** and have them

follow along and jot their notes down as they watch. The final reflection question is to be completed at the end of watching both videos. Completed handouts can be used as part of the formative assessment.

WATCH: Pulse Canada's "Better Nutrition" Video: https://youtu.be/Tgnx0G4_QvM

WATCH: Ag Canada Video: Eat Your Pulses: <https://www.youtube.com/watch?v=VtmKyR7ZpSk>

Step Three: Be A Bean Chef – “Reflect”

We've looked at overall nutrition, the power that Beans have as a nutrition source and have a deeper understanding of protein and fibre and their importance in overall health and wellbeing.

There are numerous recipes that include BEANS as an ingredient. Sometimes Beans are the *superstar* main feature of a dish, sometimes they play a supporting role. In this activity, the students are encouraged to research various ways to cook or bake with beans. They are encouraged to research various foods – and ensure that each of their creations includes beans, balanced complementary foods or ingredients and to be able to point out some of the basic nutritional benefits are in their dish.

Culminating Activity –

Students will require the following Handouts:

- Appendix 1B – Handout: **Be a Bean Chef: The Star of the Show!**
- Appendix 1C – Handout: **Be a Bean Chef: The Co-Star of the Show!**
- Appendix 1D – Handout: **Be a Bean Chef: Beans Behind the Scenes!**
- Appendix 1E – Handout: **Be a Bean Chef: Checklist for Success**

Using the criteria outlined in the handouts, design 3 dishes that include BEANS in the following roles:

1. **The “Star” of the Show – Beans should be a main feature of the dish.**
2. **The “Co-Star” of the Show – Beans should be the side dish or partner feature of the dish.**
3. **The “Extra” – Beans should be “behind the scenes” – a “hidden” food of the dish/dessert.**

ASSESSMENT AND EVALUATION

Formative Assessment:

Using participation in active discussion and **Handout 1A: Eat Your Beans!**, educators can make note of students' prior knowledge, communication skills and their basic understanding of nutrition and the value that beans have as a nutrient-dense, plant-based food. Using **Handout 1E: Checklist for Success**, students participate in a self-review of their own work before submitting.

Summative Assessment: Using **Handout 1F: Evaluation Rubric**, educators can evaluate the overall quality of the culminating activity, paying particular attention to the written description for insight into students' overall understanding of the healthful role beans play in the dish or dessert they chose to share.

ENRICHMENT

- Prepare one of your dishes for REAL with your family and share the experience and your “review” of the dish via multimedia presentation to the class.
- Instead of colouring on paper, research various dishes using beans put together a PowerPoint presentation about how beans are used in each dish, bringing attention to the various complementary foods included in each dish and the overall nutritional balance and value each dish has.

LESSON PLAN:

Innovating Solutions to Real-World Problems in Dry Bean Farming



Grades 7-8

ABOUT THIS LESSON

Students will gain an understanding of the Carbon Cycle as a whole, explore Climate Change and the Agriculture Industry's relationship with the carbon cycle. They will create a Scientific Model that allows them to explore their own questions about the relationship Agriculture has with the climate and environment and deepen their understanding using collaboration and peer discussion. Finally, students will reflect on their prior and newfound knowledge by examining a present-day, real-world issue faced by Bean Growers in Ontario. They will innovate possible ways to address the issues presented using specific criteria.

MATERIALS NEEDED

- Appendix 2A – Handout 2A: **The Story of the Carbon Cycle**
- Appendix 2B – Handout 2B: **Create A Scientific Model (Blank Template)**
- Appendix 2C – Handout 2C: **Become a Bean Industry Innovator – Scenario 1**
- Appendix 2D – Handout 2D: **Become a Bean Industry Innovator – Scenario 2**
- Appendix 2E – **Innovating Solutions to Real-World Problems in Bean Farming Rubric**
- Appendix 4 – **Vocabulary Sheet**
- Post-It Notes/Paper, Tape & Markers for Gallery Walk Activity

CURRICULUM EXPECTATIONS

SCIENCE

Understanding Life Systems: Heat in the Environment

Relating Science & Technology to Society & the Environment:

By the end of Grade 7 students will:

- 1.2 assess the environmental and economic impacts of using conventional and alternate forms of energy (fossil fuels/nuclear vs. geothermal/solar/wind/wave/biofuel, etc.)

Developing Investigation and Communication Skills:

By the end of Grade 7 students will:

- 2.6 use a variety of forms to communicate with different audiences and for a variety of purposes.

Understanding Basic Concepts:

By the end of **Grade 7** students will:

- 3.2 identify ways in which heat is produced.
- 3.8 identify common sources of greenhouse gases and describe ways of reducing emissions of gases.

Understanding Structures & Mechanisms: Systems in Action

Relating Science & Technology to Society & the Environment:

By the end of **Grade 8** students will:

- 1.2 assess the impact on individuals, society and the environment of alternative ways of meeting needs that are currently met by existing systems, taking different points of view into consideration.

Developing Investigation and Communication Skills:

By the end of **Grade 8** students will:

- 2.7 use a variety of forms to communicate with different audiences and for a variety of purposes.

Understanding Basic Concepts:

By the end of **Grade 8** students will:

- 3.1 identify various types of systems (carbon cycles, etc.)
- 3.2 identify the purpose, inputs, and outputs of various systems.
- 3.3 identify various processes and components of a system.
- 3.8 describe systems that have improved the productivity of various industries.
- 3.9 identify social factors than influence the evolution of a system.

Understanding Earth & Space Systems: Water Systems

Understanding Basic Concepts:

By the end of **Grade 8** students will:

- 3.1 identify the various states of water on the earth's surface, their distribution, relative amounts, and circulation, and the conditions under which they exist.
- 3.3 explain how human and natural factors cause changes in the water table.
- 3.4 identify factors that affect the size of glaciers and the polar ice-caps, and describe the effects of these changes on local and global water systems.

GEOGRAPHY

STRAND A: Physical Patterns in a Changing World

By the end of **Grade 7** students will:

- A.1 analyze some challenges and opportunities presented by the physical environment and ways in which people have responded to them.
- A. 2 use the geographic inquiry process to investigate the impact of natural events and/or human activities that change the physical environment, exploring the impact from a geographic perspective.
- A.3 demonstrate an understanding of significant patterns in Earth's physical features and of some natural processes and human activities that create and change those features.

STRAND B: Natural Resources Around the World: Use & Sustainability

By the end of *Grade 7* students will:

- B.1 analyze aspects of the extraction/harvesting and use of natural resources in different regions of the world, and assess ways of preserving these resources.
- B.2 use the geographic inquiry process to investigate issues related to the impact of the extraction/harvesting and/or use of natural resources around the world from a geographic perspective.

STRAND A: Global Settlement: Patterns & Sustainability

By the end of *Grade 8* students will:

- A.1 analyze some significant interrelationships between Earth's physical features and processes and human settlement patterns, and some ways in which the physical environment and issues of sustainability may affect settlement in the future.
- A.2 use the geographic inquiry process to investigate issues related to the interrelationship between human settlement and sustainability from a geographic perspective.
- A.3 demonstrate an understanding of significant patterns and trends related to human settlement and of ways in which human settlement affects the environment.

TEACHING AND LEARNING STRATEGIES

Step One: Climate Change & The Carbon Cycle – “Build on Prior Knowledge”

Guiding Question: What do you know about CLIMATE CHANGE?

Continue the Discussion:

Write the words “carbon cycle” on the board.

Ask: What do you know about the carbon cycle?

Write the words “climate change” on the board.

Ask: What do you think of when you hear these words?
Where do you see/hear these words used?
How are “Climate Change” and the “Carbon Cycle” related?
What do you know about the “Greenhouse Effect”?

How do Climate Change & The Carbon Cycle relate to Agriculture?

Provide **Handout 2A: Tell the Story of the Carbon Cycle** to students and have them use images and words to create an artistic representation of how the carbon cycle works. Try to capture as many of the elements that contribute to the overall process as you can.

WATCH: TED-Ed: The Carbon Cycle – Nathaniel Manning:

<https://www.youtube.com/watch?v=A4cPmHGegKI&feature=youtu.be>

SHARE: With a partner, compare drawings – discuss what changes/additions you should each make to your sketches and make any edits you feel are necessary.

DISCUSS: As a class, work together to create a unified model of the Carbon Cycle on the board that includes ideas from the students' sketches. Then add in where agriculture fits into the cycle.

CONSIDER: How does agriculture impact the carbon cycle and contribute to climate change?
How is agriculture impacted by climate change?

Step Two: Scientific Modeling Activity – “Explore”

Scientific modeling is a sense-making tool used by scientists to model their thinking. Scientists keep notebooks and sketch relationships and ideas to reflect their thinking. They ask a question, which leads to an investigation, which then leads to data that leads to another question, and so on. Explanations, ideas and revisions are sketched as learners are exposed to more information about the issues at play.

Guiding Question: What are some of the environmental issues that Agriculture in Ontario faces? *(These would be issues they are working to mitigate, issues they wish they had new tech or innovations to help improve their practices, ways the industry contributes to improving environmental initiatives, etc.)*

Activity: Develop a Scientific Model

Using **Handout 2B: Create A Scientific Model**, students should select one area of agriculture that relates to its role within the carbon cycle.

They should design a sketch model that includes:

- The specific, agricultural phenomenon they wish to explore (in question form).
Ex. How does Climate Change affect crop production?, How does Urban Sprawl affect Agriculture?, How does “buying local food” impact the environment?
- Sketch how they think Climate Change is affecting the phenomenon.
- Sketch specific connection points to what they’ve learned about the Carbon Cycle. How does it impact the carbon cycle? Does it disrupt it somehow? Is it affected by disruption from other forces?

Gallery Walk #1: Once they complete their first draft, they should post their models around the room and do a gallery walk sharing ideas and adding post-it notes where they point out further connections on their peers’ models. As they visit each new model, they should look to add more thoughts and ideas based on their prior knowledge and learning.

Research: Utilize some of the following resources to deepen students’ understanding of how their agricultural phenomenon is impacted by the changing climate. Give students the opportunity to edit their models as they gain new knowledge from further research and discussions.

GO VIRTUAL!

This entire activity can be adapted for a digital learning situation.

Using a brainstorming “whiteboard” style app to give the students the opportunity to share and collaborate as they explore various agricultural-related questions.

TIP: Have students use different colours with each round of edits/additions they make to help showcase the growth in knowledge throughout the process.

- **Video:** Climate 101 with Bill Nye: <https://www.youtube.com/watch?v=3v-w8Cyfoq8>
- **Video:** Water Cycling: <https://www.nationalgeographic.org/media/ocean-and-water-cycling/>
- **Video:** The Urban Water Cycle: <https://www.nationalgeographic.org/media/urban-water-cycle/>
- **Video:** Fossil Fuels: <https://www.nationalgeographic.org/media/fossil-fuels-and-carbon/>
- **Article:** The Carbon Cycle: <https://www.nationalgeographic.org/encyclopedia/carbon-cycle/>
- **Article:** Carbon Sinks: <https://www.nationalgeographic.org/encyclopedia/carbon-sources-and-sinks/>

Gallery Walk #2: Armed with some new information, students are encouraged to complete the gallery walk once more to discuss and contribute further ideas on post-it notes to their peers’ scientific models. ***What else have they learned about how these phenomena are impacted by climate change? Are there other connections they see?***

Scientific Model Revision: Students then take their scientific model along with their peers' suggestions and their own new ideas and revise their model to include the new information. Final, revised models can be collected by the teacher for assessment.

DISCUSS: How did your initial model change as you learned new information?
Are solutions to the climate problem you faced simple or complex?
What would your *next questions* be if we were to continue our learning?

Step Three: Solving Real Problems in Ontario's Dry Bean Industry – “Innovate & Reflect”

In this activity, students will be presented with real-world issues Ontario Bean Growers are facing in 2021. Students will be asked to design a new practice or form of technology that might help Ontario Bean Growers adapt or mitigate the impact to the environment. Students will innovate solutions to **one** of the “problems” presented in **Handout 2C: Become A Bean Industry Innovator – Scenario 1** and **Handout 2D: Become A Bean Industry Innovator – Scenario 2** and prepare a presentation to “pitch” to the Ontario Bean Growers.

Students will be graded on their creativity, not necessarily reality – as long as the general “mechanics” of their innovative response demonstrates a realistic application of the knowledge gained throughout this unit, the “reality” of their project will not be critiqued. Their innovative practices or inventions should consider the carbon cycle, the agricultural role within the issue and aim ultimately for a balanced or negative carbon footprint.

Watch: From Field to Fork – Ontario Bean Growers: <https://www.youtube.com/watch?v=3-eWdBqq3jq>

Continue the Discussion: Discuss as a class. What innovations do students notice IN the video? How might these innovations contribute positively or negatively to the environmental impact of Bean Farming in Ontario? How might they build on the innovations and/or technologies they see to solve the problems in their scenario?

Give students their choice of **Handout 2D: Become a Bean Industry Innovator – Scenario 1** or **Handout 2D: Become a Bean Industry Innovator – Scenario 2** and have them follow the directions on the handout. They will put together their presentation in a PowerPoint or multimedia presentation and present to the class and/or take advantage of the option to present their project to a representative from the Ontario Bean Growers (see ENRICHMENT ideas below for details).

ASSESSMENT AND EVALUATION

Formative Assessment: Using anecdotal assessment during discussions as well as the students' **Handout 2A – The Story of the Carbon Cycle** drawing and **Handout 2B – Create A Scientific Model**, a complete formative assessment of these will document the overall learning journey in this unit.

Summative Assessment: Using **Appendix 2E – Evaluation Rubric**, a complete assessment of the culminating activity will document the students' overall grasp of scientific and agricultural learning as well as their creative, innovative and persuasive ideas from their presentation.

ENRICHMENT

- Arrange for the students to present their ideas to a representative from the Ontario Bean Growers. Email Jennifer Mitchell at: jennifer@ontariobeans.on.ca to set up the presentations.

LESSON PLAN:

Bean Farmers Career Fair



Grades 9-10

ABOUT THIS LESSON

In this activity, students will explore various careers found in the Ontario Bean Growing industry and Canada's Agricultural Industry as a whole. They will familiarize themselves with all of the roles and responsibilities associated with ONE of the careers and research the necessary training and educational pathways to that career. Using a "career fair" style approach, students will present their career to the class and engage each other in a either a trade-show style showcase or with multimedia oral presentations that encourage sharing and learning as they explore each career.

MATERIALS NEEDED

- Appendix 3A – Handout 3A – **Exploring Careers in the Ontario Dry Bean Industry**
- Appendix 3B – Handout 3B – **Career Descriptions**
- Appendix 3C – **Bean Farmers Career Fair Evaluation Rubric**
- Appendix 3D – Handout 3D – **Peer Evaluation & Final Reflection**

CURRICULUM EXPECTATIONS

GUIDANCE & CAREERS EDUCATION – (GLC20)

B2: Preparing for Future Opportunities

Develop a personal profile based on an exploration of their interests, values, skills, strengths, and needs, and examine the range of factors that can influence their future education and career/life opportunities.

By the end of this course, [Grade 10](#) students will:

- B2.1 investigate their own interests, values, skills (including transferable skills), strengths, and areas that require further development, documenting their insights in a personal profile.
- B2.2 identify factors and conditions other than an individual's strengths, interests, and needs that inform education and career/life choices, and explain which of these factors may be influencing their own decisions.
- B2.3 explain how digital media use and a social media presence can influence their education and career/life opportunities, while at the same time demonstrating an understanding of the importance of managing their personal information and protecting their privacy online.
- B2.4 analyze the role of networking, including traditional and online social networking, in exploring and securing education and career/life opportunities.

B3: Identifying Possible Destination and Pathways

Taking their personal profile into account, explore, research, and identify a few postsecondary destinations of interest, whether in apprenticeship training, college, community living, university, or the workplace, and investigate the secondary school pathways that lead to those destinations.

By the end of this course, *Grade 10* students will:

- B3.1 use a research process to identify and compare a few postsecondary options that suit their aspiration, skills, interests, values and personal circumstances.
- B3.2 identify the pathways towards their preferred destinations, including the courses and/or specialized programs that lead to the destination and meet the requirements for a secondary school certificate or diploma, as well as the supports available at school and in the community that can enhance their secondary education.

LANGUAGE ARTS – GRADE 9 ACADEMIC (ENG1D)

Oral Communication

By the end of this course, *Grade 9* students will:

- 1.2 identify and use several different active listening strategies when participating in a variety of classroom interactions.
- 1.9 explain how several different presentation strategies are used in oral texts to inform, persuade, or entertain.
- 2.1 communicate orally for several different purposes, using language suitable for the intended audience.
- 2.3 communicate in a clear, coherent manner appropriate to the purpose, subject matter, and intended audience.
- 2.7 use several different audio-visual aids to support and enhance oral presentations.

Media Studies

By the end of this course, *Grade 9* students will:

- 1.2 interpret simple and complex media texts, identifying and explaining the overt and implied messages they convey.
- 3.2 select a media form to suit the topic, purpose, and audience for a media text they plan to create, and explain why it is an appropriate choice.
- 3.4 produce media texts for several different purposes and audiences, using appropriate forms, conventions, and techniques.

LANGUAGE ARTS – GRADE 9 APPLIED (ENG1P)

Oral Communication

By the end of this course, *Grade 9* students will:

- 1.2 identify and use a few different active listening strategies when participating in classroom interactions.
- 1.9 identify how a few different presentation strategies are used in oral texts to inform, persuade, or entertain.
- 2.1 communicate orally for a few different purposes and audiences.
- 2.3 communicate in a clear, coherent manner for a few different purposes..
- 2.7 use a few different audio-visual aids to support oral presentations.

Media Studies

By the end of this course, Grade 9 students will:

- 1.2 interpret simple media texts and some teacher-selected complex media texts, identifying some of the overt and implied messages they convey.
- 3.2 select a media form to suit the topic, purpose, and audience for a media text they plan to create, and explain why it is an appropriate choice.
- 3.4 produce media texts for a few different purposes and audiences, using appropriate forms, conventions, and techniques.

LANGUAGE ARTS – GRADE 10 ACADEMIC (ENG2D)

Oral Communication

By the end of this course, Grade 10 students will:

- 1.2 select and use appropriate active listening strategies when participating in a variety of classroom interactions.
- 1.9 evaluate the effectiveness of a variety of presentation strategies used in oral texts, including increasingly complex texts, and suggest other strategies that could be used effectively.
- 2.1 communicate orally for a variety of purposes, using language appropriate for the intended audience.
- 2.3 communicate in a clear, coherent manner, using a structure and style appropriate to the purpose, subject matter, and intended audience.
- 2.7 use a variety of audio-visual aids appropriately to support and enhance oral presentations and to engage an audience.

Media Studies

By the end of this course, Grade 10 students will:

- 1.2 interpret media texts, including increasingly complex texts, identifying and explaining the overt and implied messages they convey.
- 3.2 select a media form to suit the topic, purpose, and audience for a media text they plan to create, and explain why it is an appropriate choice.
- 3.4 produce media texts for a variety of purposes and audiences, using appropriate forms, conventions, and techniques.

LANGUAGE ARTS – GRADE 10 APPLIED (ENG2P)

Oral Communication

By the end of this course, Grade 10 students will:

- 1.2 identify and use several different active listening strategies when participating in a variety of classroom interactions.
- 1.9 explain how several different presentation strategies are used in oral texts to inform, persuade, or entertain.
- 2.1 communicate orally for several different purposes, using language suitable for the intended audience.

- 2.3 communicate in a clear, coherent manner appropriate to the purpose, subject matter, and intended audience.
- 2.7 use several different audio-visual aids to support and enhance oral presentations.

Media Studies

*By the end of this course, **Grade 10** students will:*

- 1.2 interpret simple and complex media texts, identifying and explaining the overt and implied messages they convey.
- 3.2 select a media form to suit the topic, purpose, and audience for a media text they plan to create, and explain why it is an appropriate choice.
- 3.4 produce media texts for several different purposes and audiences, using appropriate forms, conventions, and techniques.

SCIENCE – GRADE 9 ACADEMIC (SNC1D)

A: Scientific Investigation Skills & Career Exploration

*By the end of this course, **Grade 9** students will:*

- A2.1 identify and describe a variety of careers related to the fields of science under study (e.g., astrophysicist, geophysicist, conservation officer, park warden, fire protection engineer, hydrologist, electrician) and the education and training necessary for these careers.
- A2.2 identify scientists, including Canadians (e.g., David Suzuki, Howard Alper, Roberta Bondar, Kenneth Hill), who have made a contribution to the fields of science under study.

SCIENCE – GRADE 9 APPLIED (SNC1P)

A: Scientific Investigation Skills & Career Exploration

*By the end of this course, **Grade 9** students will:*

- A2.1 identify and describe a variety of careers related to the fields of science under study (e.g., radar satellite technician, fish and wildlife technologist, ceramicist, electrician) and the education and training necessary for these careers.
- A2.2 identify scientists, including Canadians (e.g., Kim Fernie, Robert Ackman, Helen Hogg, Kenneth Hill), who have made a contribution to the fields of science under study.

SCIENCE – GRADE 10 ACADEMIC (SNC2D)

A: Scientific Investigation Skills & Career Exploration

*By the end of this course, **Grade 10** students will:*

- A2.1 identify and describe a variety of careers related to the fields of science under study (e.g., meteorologist, medical illustrator, geochemist, optical physicist) and the education and training necessary for these careers.
- A2.2 identify scientists, including Canadians (e.g., Sheela Basrur, William Richard Peltier, Alice Wilson, Willard Doyle), who have made a contribution to the fields of science under study.

SCIENCE – GRADE 10 APPLIED (SNC2P)

A: Scientific Investigation Skills & Career Exploration

By the end of this course, *Grade 10* students will:

- A2.1 identify and describe a variety of careers related to the fields of science under study (e.g., veterinarian assistant, quality control technician, conservation officer, sound and light technician) and the education and training necessary for these careers.
- A2.2 identify scientists, including Canadians (e.g., Maude Abbott, Paul Kebarle, Reginald Fessenden, James Hillier), who have made a contribution to the fields of science under study.

ISSUES IN CANADIAN GEOGRAPHY – GRADE 9 ACADEMIC (CGC1D)

A: Geographic Inquiry & Skill Development

By the end of this course, *Grade 10* students will:

- A2.1 describe ways in which geographic investigation can help them develop skills, including spatial technology skills, and the essential skills in the Ontario Skills Passport.
- A2.2 apply everyday contexts skills and work habits developed through geographic investigation.
- A2.4 identify careers in which a geography background might be an asset.

B: Interactions in the Physical Environment

By the end of this course, *Grade 10* students will:

- B1.1 analyze environmental, economic, social and/or political implications of different ideas and beliefs about the value of Canada's natural environment, and explain how these ideas/beliefs affect the use and protection of Canada's natural assets.
- B1.2 analyze interrelationships between Canada's physical characteristics and various human activities that they support.
- B2.1 analyze interrelationships between physical processes, phenomena, and events in Canada and their interaction with global physical systems.

C: Managing Canada's Resources & Industries

By the end of this course, *Grade 10* students will:

- C1.2 describe strategies that industries and governments have implemented to increase the sustainability of Canada's natural resources.
- C1.2 assess the impact of Canada's participation in international trade agreements and of globalization on the development and management of human and natural resources in Canada.
- C1.3 analyze the influence of governments, advocacy groups, and industries on the sustainable development and use of selected Canadian resources.
- C3.1 compare the economic importance of different sectors of the Canadian economy.
- C3.4 analyze the main factors that need to be considered when determining the location of sites for different types of industries.

D: Changing Populations

By the end of this course, *Grade 10* students will:

- D1.2 identify global demographic disparities that are of concern to people living in Canada, and assess the roles of individuals, organizations and governments in Canada addressing them.
- D1.3 determine criteria that should be used to assess Canada's responses to global population issues.

E. Liveable Communities

By the end of this course, Grade 10 students will:

- E1.1 analyze the effects of food production practices, distribution methods, and consumer choices on the sustainability of Canada's food system.
- E2.1 assess the impact of urban growth on natural systems.
- E2.2 analyze various economic, social and political impacts of urban growth.
- E3.1 analyze the characteristics of different land uses in a community.

ISSUES IN CANADIAN GEOGRAPHY – GRADE 9 APPLIED (CGC1P)

A: Geographic Inquiry & Skill Development

By the end of this course, Grade 9 students will:

- A2.1 describe ways in which geographic investigation can help them develop skills, including spatial technology skills, and the essential skills in the Ontario Skills Passport.
- A2.2 apply everyday contexts skills and work habits developed through geographic investigation.
- A2.4 identify careers in which a geography background might be an asset.

B: Interactions in the Physical Environment

By the end of this course, Grade 9 students will:

- B1.3 analyse some environmental, economic, and social impacts of changes in Canada's climate.
- B1.4 explain how human activities in their local region can have an impact on natural processes.
- B2.1 explain how the natural characteristics of an area in Canada influence human activities.
- B2.2 explain the influence of Canada's natural characteristics (e.g., climate, soils, topography, proximity to water, natural resources) on the spatial distribution of its population.

C: Managing Canada's Resources & Industries

By the end of this course, Grade 9 students will:

- C1.1 identify major sources of energy used in Canada (e.g., fossil fuels, nuclear, hydro), and assess the viability of alternative energy options for various communities across Canada.
- C1.2 assess the impact of different types of food production on resource use and the environment in Canada.
- C2.2 describe Canada's major exports and imports, and assess some of the environmental, economic, social, and political implications of Canada's current export and import patterns.
- C2.3 assess the economic, environmental, social, and political significance of a specific industry for their local area or another area of their choice.
- C3.1 identify the natural resources needed to produce and distribute a product that is used in the everyday lives of people living in Canada

D: Changing Populations

By the end of this course, Grade 9 students will:

- D1.1 assess economic, social, and environmental impacts of major population trends in Canada today.
- D1.3 describe ways in which Canadian society can respond to the needs of a changing population.

E. Liveable Communities

By the end of this course, Grade 9 students will:

- E1.3 describe ways in which communities can improve their environmental sustainability.
- E1.4 identify actions that individuals can take to live more sustainably, and explain the benefits for their local community.
- E2.1 analyse interrelationships between the built and natural environments.
- E2.2 assess the compatibility of different types of land uses with each other within their local community.
- E2.3 explain how changes in land use can affect the growth or decline of different parts of a community.
- E3.1 describe different types of land use within their community.

GREEN INDUSTRIES – GRADE 10 (THJ20)

A: Green Industry Fundamentals

By the end of this course, Grade 10 students will:

- A2.1 describe environmental factors that affect growth and post-harvest quality.
- A2.2 describe biological factors that affect growth and post-harvest quality.
- A2.3 identify a variety of pests and diseases.
- A3.2 identify a variety of design concepts and production processes and systems used in the green industries.
- A3.3 demonstrate an understanding of a variety of processes used in plant and/or animal care.
- A3.4 identify and describe a variety of structural or mechanical systems used within the green industries.
- A4.1 demonstrate an understanding of terminology used in the green industries and use it correctly in oral and written communication.
- A4.2 identify sources of information about techniques and best practices in the green industries.

C: Technology, The Environment & Society

By the end of this course, Grade 10 students will:

- C1.1 identify ways in which green industry activities affect the environment.
- C1.2 identify best management practices, environmentally sustainable practices, and technologies that can be used to reduce the harmful effects of green industry operations.
- C2.1 describe the societal and economic implications of recent innovations and trends in the green industries.
- C2.2 identify ethical issues related to the green industries.
- C3.1 identify local green industries and describe their activities or products within a specific region.
- C3.3 describe the effects of local green industries on the community.

D: Professional Practice & Career Opportunities

By the end of this course, Grade 10 students will:

- D2.1 describe career opportunities in a variety of sectors in the green industries and the education, training, and certification required for employment in green industry occupations.

- D2.2 identify ways of acquiring knowledge and experience in green industry occupations.
- D2.3 identify groups and programs that are available to support students who are interested in pursuing non-traditional career choices in the green industries.
- D2.4 demonstrate an understanding of the Essential Skills that are important for success in the green industries, as identified in the Ontario Skills Passport.
- D2.5 demonstrate an understanding of the work habits that are important for success in the green industries, as identified in the Ontario Skills Passport.

TEACHING AND LEARNING STRATEGIES

Step One: Careers in the 21st Century – “Build on Prior Knowledge”

ASK STUDENTS:

What are you PASSIONATE about? What do you LOVE doing? Hobbies?

What SKILLS are required to do those things that you love?

Example:

** hockey player = teamwork, physical skill, endurance, leadership*

** playing video games = technology, coding, etc.*

What jobs in AGRICULTURE might use those same skills?

Example:

** hockey player = physical skill/endurance, teamwork – farmer; leadership – farm manager, etc.*

** playing video games = technology/coding – Agricultural Tech Industry (drone technologies, processing automation, innovative farm design, etc.)*

There are careers that exist today that did not exist even 20 short years ago. With innovative technologies driving the 21st century workforce, today's employment seekers must consider that the career they train for today, won't look the same 5, 10 or even 20 years from now. We are forced to become lifelong learners, adapting to social and economic trends.

Agriculture is no exception to this fast-paced evolution.

1 in 8 jobs in Canada are in the Agricultural Sector. Each of us would be remiss to not at least consider how “what we want to do when we grow up” might somehow connect to our agriculture and food system.

So today, in order to give you a more specific look at the vast number of career opportunities in agriculture, everyone is going to become employees in Ontario's dry, edible bean industry!

WATCH: From Field to Fork – Ontario Bean Growers: <https://www.youtube.com/watch?v=3-eWdBqq3jg>

ASK STUDENTS: What “jobs” did you notice in this video? *Crop Producer/Farmer, Truck Driver, Crop Scout, Processing Operator, Quality Assurance Manager, Nutritionist/Dietician ...*

Step Two: Learning about Careers in Ontario's Bean Industry – “Explore”

Consider the following and select ONE career from the list in **Handout 3B: CAREER DESCRIPTIONS** to research and share with the class. In the handout, students are guided to consider the following when selecting their career:

- ***Which career might connect with your own passions/interests?***
- ***Which career is brand new to me that I would like to learn more about?***

Once you have your bean career selected, follow the instructions in **Handout 3A: Exploring Careers Connected to the Ontario Dry Bean Industry** and use **Handout 3C: Evaluation Rubric** to guide you.

Gather all of the information you can about your selected career:

- A description of the career - elaborate on the various roles & responsibilities of that career, paying special attention to how the career specifically relates to Ontario's Dry Bean Industry and expanding to look at it from how it fits into Canada's Ag Sector as a whole.
- List the educational pathways (schools/training programs) that lead to that career.
- Explore stories and gather any articles or firsthand accounts of people who work in that career - especially in Ontario's Dry Bean Industry.
- Include any current research, data or statistical information that might enhance your presentation.
- Share your personal response to the following:
 - Why is this career important to Ontario's dry bean industry?
 - What do you personally find interesting about this career?
 - How does it align or connect with any of your personal skills and gifts?
 - Could you ever see yourself working in agriculture? Why or why not?

Step Three: Career Fair – “Present & Reflect”

Create a presentation that showcases your career and engages your peers in a relevant, engaging way:

- Use posterboard or a presentation board to put together a colourful, engaging display with all of your information.

OR

- Create a multimedia presentation using various photos/graphics and/or video and a digital software program that can be used in an in-class or online oral presentation.

Use **Handout 3C: Evaluation Rubric** to guide your path to success in this unit.

Use **Handout 3D: Peer Evaluation & Self Reflection** to reflect on your learning in this unit.

ASSESSMENT AND EVALUATION

Formative Assessment: By creating appropriate checkpoints for success throughout the information-gathering phase of this assignment, educators can create anecdotal notes on student progress. Student contribution to discussions, active participation and effective peer and self-evaluation, student learning can be assessed.

Summative Assessment: Using **Handout 3D: Evaluation Rubric**, educators can assess students' overall learning and build skills according to how their chosen career exploration meets curriculum guidelines. Peer and self-reflection can also be assessed in a more formal way using the rubric.

ENRICHMENT EXTENSION ACTIVITIES

- The classroom or another gathering space like the school's library can be set up “trade show” style so students, peers from other classes, etc. can visit each booth to learn about each career.
- Email jennifer@ontariobeans.on.ca to connect with the Ontario Bean Growers so the students can connect and interview real people working in the industry.

CITATIONS

- ¹ Food and Agriculture Organization of the United Nations: <http://www.fao.org/3/a-bc435e.pdf>
- ² Ontario Bean Grower's Twitter Post: <https://twitter.com/OntBeanGrowers/status/1031535392368087041>
- ³ Pulses: Nutritious Seeds for a Sustainable Future: <http://www.fao.org/3/i5528e/i5528e.pdf> p.38
- ⁴ Pulses: Nutritious Seeds for a Sustainable Future <http://www.fao.org/3/i5528e/i5528e.pdf> , p.39
- ⁵ The Real Dirt on Farming: <https://www.realdirtontfarming.ca/flipbooks/english-2020/mobile/index.html> , p. 10
- ⁶ Pulses: Nutritious Seeds for a Sustainable Future <http://www.fao.org/3/i5528e/i5528e.pdf> , p.41
- ⁷ Canada's Food Guide, Proteins Are Good for You: <https://bit.ly/3lbsBJB>

LINKS

Ontario Bean Growers – From Field to Fork: <https://www.youtube.com/watch?v=3-eWdBqq3jg>

Packaging Thompson's Beans: <https://www.youtube.com/watch?v=lnjESntNvVQ&feature=youtu.be>

Terri Ney, Registered Dietician: <https://ontariobean.on.ca/how-to-videos/>

Alberta, Canada Bean Plant Science – “The Story of Beans”: <https://www.youtube.com/watch?v=rb8wfbLZfqs>

Ontario Bean Growers – Recipes: <https://ontariobean.on.ca/recipes/>

Ontario Bean Growers – “Fun Bean Facts”: <https://ontariobean.on.ca/all-about-beans/bean-facts/>

Evolution of Canada's Food Guide: <https://www.canada.ca/en/health-canada/services/canada-food-guide/about/history-food-guide.html>

Canada's Food Guide 2019: <https://food-guide.canada.ca/en/>

TVOKids – New Canadian Food Guide: <https://www.youtube.com/watch?v=CsvBBfRDjbg>

Health Canada – Protein: <https://www.canada.ca/en/health-canada/services/nutrients/protein.html>

Health Canada – Fibre: <https://www.canada.ca/en/health-canada/services/nutrients/fibre.html>

Pulse Canada – Better Nutrition: https://youtu.be/Tgnx0G4_QvM

Agriculture Canada – Eat Your Pulses: <https://www.youtube.com/watch?v=VtmKyR7ZpSk>

Climate 101 with Bill Nye: <https://www.youtube.com/watch?v=3v-w8Cyfoq8>

National Geographic – Water Cycling: <https://www.nationalgeographic.org/media/ocean-and-water-cycling/>

National Geographic – The Urban Water Cycle: <https://www.nationalgeographic.org/media/urban-water-cycle/>

National Geographic – Fossil Fuels: <https://www.nationalgeographic.org/media/fossil-fuels-and-carbon/>

National Geographic – The Carbon Cycle: <https://www.nationalgeographic.org/encyclopedia/carbon-cycle/>

National Geographic – Carbon Sources & Sinks: <https://www.nationalgeographic.org/encyclopedia/carbon-sources-and-sinks/>

ADDITIONAL RESOURCES: WEBSITES FOR TEACHERS AND STUDENTS

Ontario Bean Growers	www.ontariobeans.on.ca
Pulse Canada	www.pulsecanada.com
Agriculture and Agri-Food Canada.....	www.agr.gc.ca
FAO:2016 International Year of Pulses.....	http://www.fao.org/pulses-2016/about/en/
Foodland Ontario.....	https://www.ontario.ca/foodland-ontario
Health Canada	www.hc-sc.gc.ca
Ontario Ministry of Agriculture, Food and Rural Affairs	www.omafra.gov.on.ca
Careers in Food	www.careersinfood.com
Ag Careers	www.agcareers.com
Agricultural Employment	www.agemploy.com
Ontario Agricultural College	www.uoguelph.ca/oac
The Real Dirt on Farming	https://www.realdirtontfarming.ca/

NAME: DATE:

Eat Your Beans!

Pulse Canada: "Better Nutrition"

1. What are some of the key nutrients in pulses?

2. Why are carbohydrates important?

3. What is the most common nutrient people don't get enough of?

Ag Canada: "Eat Your Pulses"

1. Why do Canadian Farmers like growing pulses?

2. Why are Canadian Scientists trying to find ways to include pulses in more of Canada's prepared foods?

Reflect: Share one new thing you learned about pulses from watching these two videos and why you thought it was interesting.





NAME: _____

DATE: _____

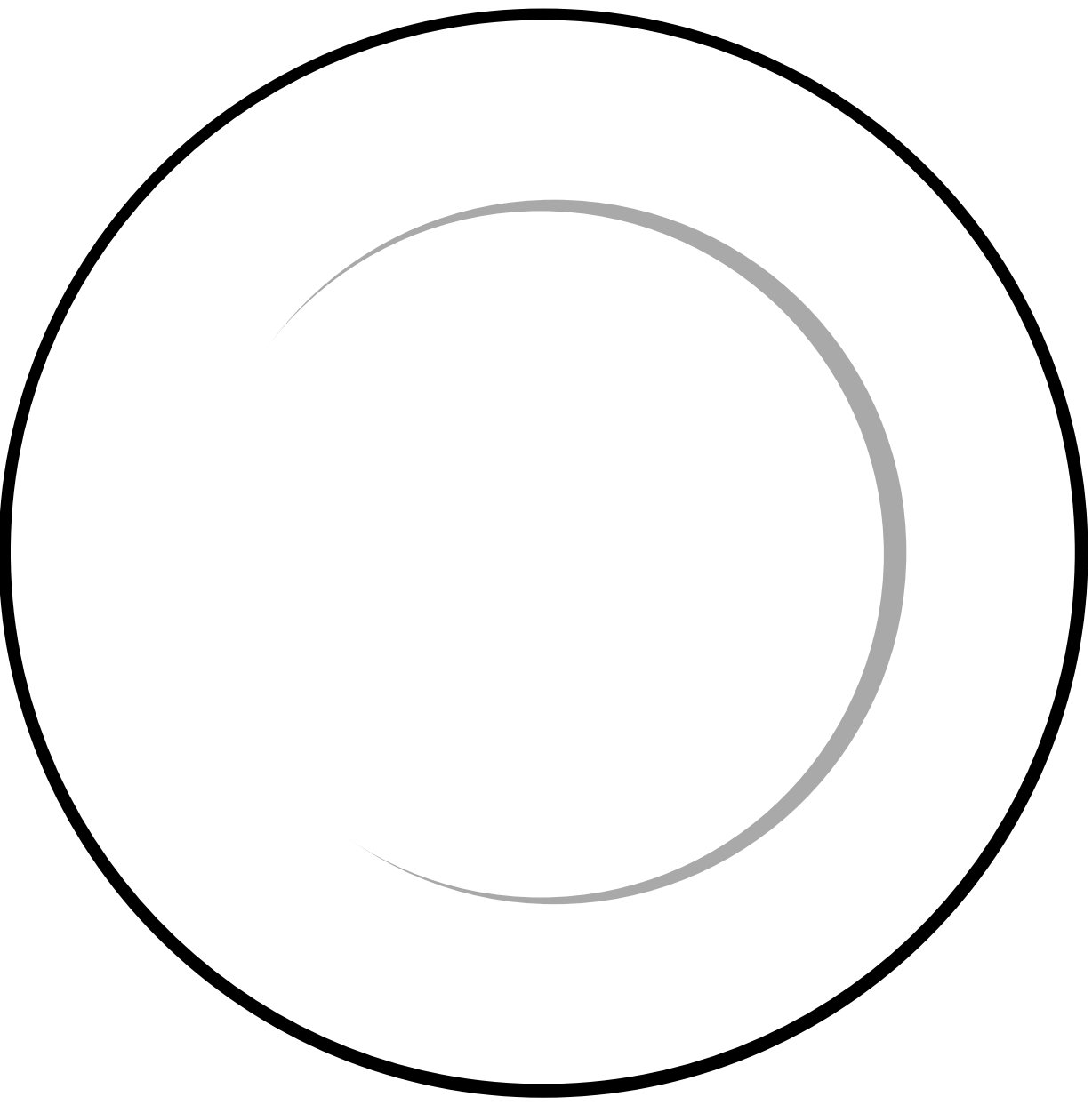
Be A Bean Chef:

THE STAR OF THE SHOW

Plan and draw a meal that stars Ontario Beans as the STAR of the Show! Beans should be the OBVIOUS FEATURE ingredient in this dish, complemented by other foods from other food groups to make up a balanced meal that the Canada Food Guide would be proud of!

Use the "Be a Bean Chef" Checklist to make sure your creation meets all the criteria for success!

Label the foods and where the protein, fibre and at least one other nutrient can be found in your dish! Include a write-up on the back that describes your dish.





NAME: _____

DATE: _____

Be A Bean Chef:

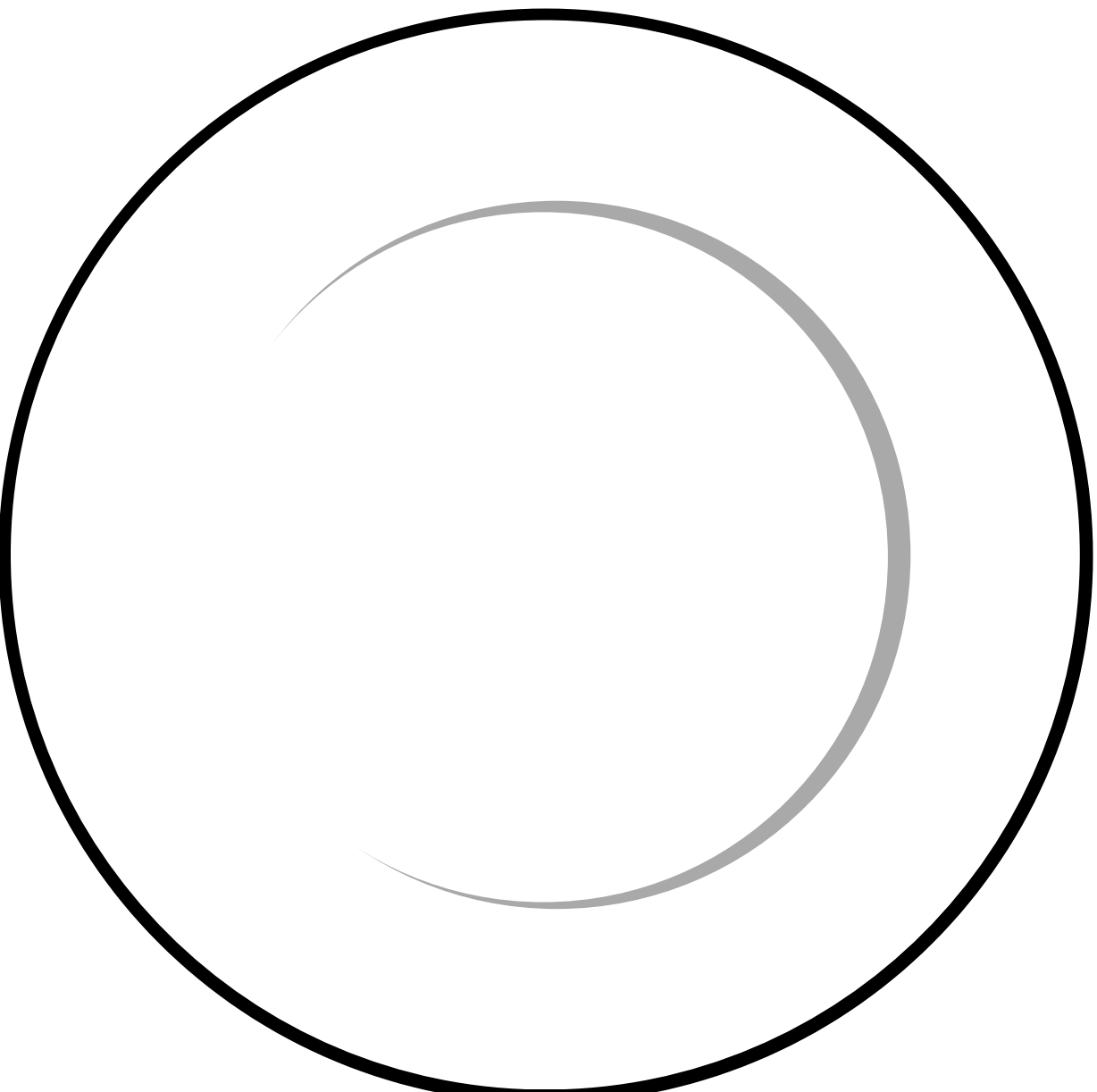
THE CO-STAR OF THE SHOW

Plan and draw meal that stars Ontario Beans as the CO-STAR of the Show!

Beans should be the SIDE DISH or PARTNER FEATURE ingredient in this dish, complemented by other foods from other food groups to make up a balanced meal that the Canada Food Guide would be proud of!

Use the "Be a Bean Chef" Checklist to make sure your creation meets all the criteria for success!

Label the foods and where the protein, fibre and at least one other nutrient can be found in your dish! Include a write-up on the back that describes your dish.





NAME: _____

DATE: _____

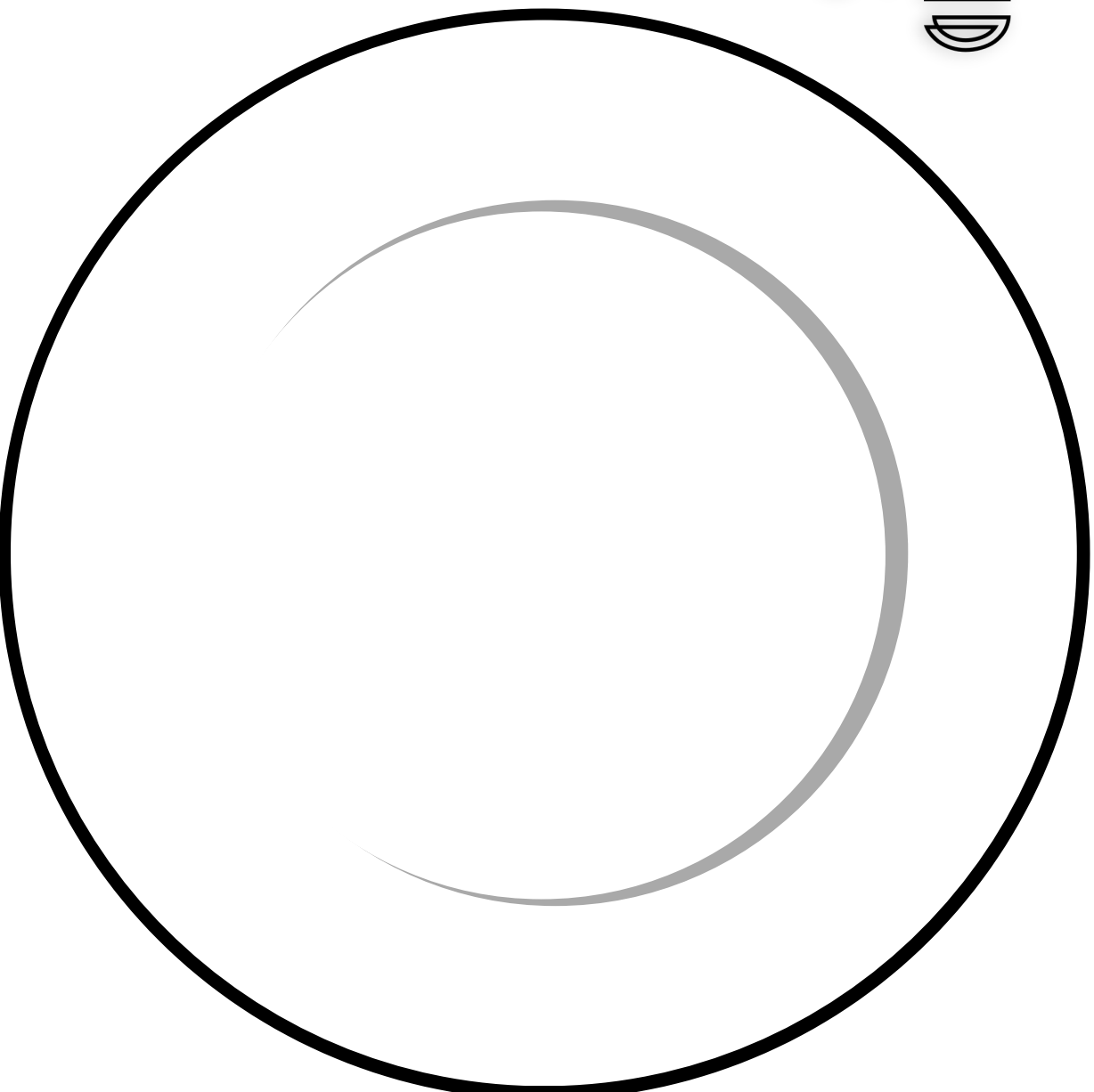
Be A Bean Chef:

BEANS BEHIND THE SCENES

Plan and draw a meal that stars Ontario Beans as a "substitute" or "hidden" ingredient in this dish or dessert, complemented by ingredients to make up a more healthful version of your dish that the Canada Food Guide would be proud of!

Use the "Be a Bean Chef" Checklist to make sure your creation meets all the criteria for success!

In a write-up on the back, explain how beans were hidden in this dish/dessert and list at least 3 beneficial nutrients beans add to the dish/dessert.



NAME: _____

DATE: _____



Be A Bean Chef: Checklist

THE STAR
OF THE SHOW

THE (CO-)STAR
OF THE SHOW

BEANS BEHIND
THE SCENES

☐ BEANS are the main feature of the dish. They are not hidden.

☐ BEANS are the side dish or partner feature of the dish.

☐ BEANS are the unseen substitute or "hidden" ingredient in this dish.

☐ There are complementary foods representing different food groups in the dish.

☐ There are complementary foods representing different food groups in the dish.

☐ By substituting or hiding beans into this dish or dessert you create a more healthful version of it.

☐ The dish is coloured neatly and at least 3 nutrients are labeled clearly, including protein and fibre.

☐ The dish is coloured neatly and at least 3 nutrients are labeled clearly, including protein and fibre.

☐ The dish or dessert is coloured neatly.

☐ The written description outlines the ingredients as well as the nutritional value of the dish.

☐ The written description outlines the ingredients as well as the nutritional value of the dish.

☐ The written description outlines how beans are hidden and the nutritional benefit they add to it.



Be A Bean Chef: Evaluation Rubric

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
The STAR of the Show Dish	<ul style="list-style-type: none"> BEANS were not the feature element of the dish. Design was partially complete and/or not as neat as it could be. Written description partially described the dish and 1 or less of the nutrients. 	<ul style="list-style-type: none"> BEANS were the feature element; accompanying foods did not totally balance the overall dish. Design was mostly complete and neatly drawn. Written description described the dish and at least 2 nutrients. 	<ul style="list-style-type: none"> BEANS were the feature element and paired with complementary foods. Design was complete and neatly drawn. Written description described the dish and at least 3 nutrients. 	<ul style="list-style-type: none"> BEANS were the feature element and paired well with complementary foods. Design was complete and neatly drawn. Written description described the dish and more than 3 nutrients.
The CO-STAR of the Show Dish	<ul style="list-style-type: none"> BEANS were overshadowed by other aspects of the dish and/or totally hidden from view. Design was partially complete and/or not as neat as it could be. Written description partially described the dish and 1 or less of the nutrients. 	<ul style="list-style-type: none"> BEANS were partially overshadowed by other aspects of the dish and/or were hidden. Design was mostly complete and neatly drawn. Written description described the dish and at least 2 nutrients. 	<ul style="list-style-type: none"> BEANS were appropriately paired with complementary foods and had a prominent role in the dish. Design was complete and neatly drawn. Written description described the dish and at least 3 nutrients. 	<ul style="list-style-type: none"> BEANS were a perfectly balanced co-feature of the dish and paired well with complementary foods. Design was complete and neatly drawn. Written description described the dish and more than 3 nutrients.
Beans Behind the Scenes Dish or Dessert	<ul style="list-style-type: none"> BEANS were not used as a reasonable substitute or hidden aspect of the dish or dessert. Design was partially complete and/or not as neat as it could be. Written description partially described the dish. 	<ul style="list-style-type: none"> BEANS were reasonably used as a substitute or hidden aspect of the dish or dessert. Design was mostly complete and neatly drawn. Written description lacked a full description of the dish and its nutritional value. 	<ul style="list-style-type: none"> BEANS were appropriately used as a substitute or hidden aspect of the dish or dessert. Design was complete and neatly drawn. Written description described the dish and how beans add to nutrition. 	<ul style="list-style-type: none"> BEANS were exceptionally used as a substitute or hidden aspect of the dish or dessert. Design was complete and neatly drawn. Written description described the dish and elaborated on how beans add to overall nutritional value.
Self-Regulation/ Use of Checklist	<ul style="list-style-type: none"> Student completed some of the checklist and lacked organization. Student completed some of the tasks and associated elements. Student did not complete the project in a timely manner. 	<ul style="list-style-type: none"> Student completed the checklist and demonstrated a satisfactory levels of organization. Student completed most of the tasks and associated elements. Student submitted some or most of the project on time. 	<ul style="list-style-type: none"> Student completed the checklist and demonstrated acceptable levels of organization. Student completed all 3 tasks and their associated elements. Student submitted project in a timely manner. 	<ul style="list-style-type: none"> Student completed the checklist and demonstrated exceptional levels of organization. Student completed all 3 tasks and their associated elements. Student submitted project in a timely manner.

NAME: DATE:

The Story of the Carbon Cycle

Watch "The Carbon Cycle" by Nathaniel Manning. Use images and words to create an artistic representation of how the carbon cycle works. Try to capture as many of the elements that contribute to the overall process as you can. Then discuss the Carbon Cycle with a partner and edit or add to your sketch as you share.



NAME: DATE:

Create A Scientific Model

Question for Exploration:

Scientific Model:



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info@agscape.ca

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NAME:

DATE:

Become a Bean Industry Innovator

Scenario 1: Increasing Soil Health

Farming dry beans often requires more **soil tillage** than other field crops to grow a strong, healthy crop. Tilling the soil is also a herbicide-free method for improving weed control. However, **soil erosion** is a concern with tilled fields as there are environmental implications (sediment and nutrient loss via wind and run-off into waterways).

"**No-till**" fields, which leaves the soil relatively undisturbed, tends also to lead to poor emergence (fewer seeds grow into healthy plants), lower yield (less plants fully mature which means less beans make it to market), often results in corn residue from previous crops getting into the harvested beans, and leads to issues with the weeds being more difficult to control.

The bottom line is that improved soil structure and retention of soil organic matter (think of the carbon cycle!) would likely provide long-term benefits to both soil health and crop yields.

BIG QUESTION: How can producers reduce tillage to improve soil structure and reduce soil loss, but ensure good emergence of dry beans, manage weeds and manage residue from the corn crop the previous year?

Design a new **farming practice** or **innovative technology** that might help Ontario Bean Growers solve the problems they face and **limit the impact to the environment**.

Your solution should be creative and demonstrate a realistic application of the knowledge you've gained throughout this unit. Your farming practice or invention should give consideration to the carbon cycle and aim for a balanced or negative **carbon footprint**.

Your presentation should include:

- Your ANSWERS to the BIG QUESTION in your scenario.
- A detailed description of your new farming practice or invention.
- A diagram or picture of your farming practice or invention.
- A step-by-step account of how your farming practice or invention will be used.
- A description of how your new farming practice or invention 'fits' into the carbon cycle.

Assemble your information together into a PowerPoint or multimedia presentation.



NAME: _____

DATE: _____

Become a Bean Industry Innovator

Scenario 2: Dealing With Pests

Dry beans are a very important **protein source** for the world's population. **Neonicotinoid** seed treatments (neonics) protect young bean plants from the Potato Leaf Hopper, an insect that damages the leaves to the point that it can kill the plant completely. There are 3 main neonics approved for agricultural use in Canada: imidacloprid, clothianidin, and thiamethoxam. If neonics were not available, a farmer would be forced to spray with a more costly, less environmentally and user-friendly alternative pesticide called **cygon** in order to protect young bean plants from the Potato Leaf Hopper. Neonics and cygon are the only approved and effective pesticides that work against this insect.

The Issue: The use of neonics - the more cost-effective and environmentally-friendly pesticide option - is currently under review by the **Pest Management Regulatory Agency** (PMRA) due to concerns about their effect on aquatic invertebrates. However, if neonics are removed as an option, Canadian pulse growers - including Ontario Bean Growers - will be forced to revert to using cygon - the more expensive and environmentally-damaging pesticide option - as their only current protection.

BIG QUESTION: How can you help the Ontario Bean Growers face the economic and environmental issues that the Potato Leaf Hopper presents?

Design a new **farming practice** or **innovative technology** that might help Ontario Bean Growers solve the problems they face and **limit the impact to the environment**.

Your solution should be creative and demonstrate a realistic application of the knowledge you've gained throughout this unit. Your farming practice or invention should give consideration to the carbon cycle and aim for a balanced or negative **carbon footprint**.

Your presentation should include:

- Your ANSWERS to the BIG QUESTION in your scenario.
- A detailed description of your new farming practice or invention.
- A diagram or picture of your farming practice or invention.
- A step-by-step account of how your farming practice or invention will be used.
- A description of how your new farming practice or invention 'fits' into the carbon cycle.

Assemble your information together into a PowerPoint or multimedia presentation.



NAME:

DATE:

Innovating Solutions to Real-World Problems in Dry Bean Farming

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Farming Practice/Invention	<ul style="list-style-type: none"> Project includes a basic description of innovation. Project diagram illustrates its general purpose. Innovation somewhat addresses the "big problem" in the chosen scenario. 	<ul style="list-style-type: none"> Project includes a description of innovation and its use. Project diagram illustrates its general purpose. Innovation addresses the "big problem" in the chosen scenario. 	<ul style="list-style-type: none"> Project includes a detailed description of innovation and how it is to be used. Project diagram is neat, detailed and clearly illustrates its purpose. Innovation clearly addresses the "big problem" in the scenario. 	<ul style="list-style-type: none"> Project includes a descriptive, clear and detailed description of innovation and how it is to be used. Project diagram is exceptional and illustrates its purpose in detail. Innovation clearly addresses the "big problem" in the scenario.
Communication	<ul style="list-style-type: none"> Writing uses some appropriate literary conventions for descriptive & persuasive writing. Writing has some spelling and grammar errors. Purpose is unclear and somewhat addresses the "big problem". 	<ul style="list-style-type: none"> Writing uses most of the appropriate literary conventions for descriptive & persuasive writing. Writing has some spelling and grammar errors. Purpose is somewhat conveyed and addresses the "big problem". 	<ul style="list-style-type: none"> Writing uses all of the appropriate literary conventions for descriptive and persuasive writing. Writing is generally free of spelling and grammar errors. Purpose is conveyed and addresses the "big problem". 	<ul style="list-style-type: none"> Writing uses all of the appropriate literary conventions for descriptive and persuasive writing. Writing is free of spelling and grammar errors. Purpose is clearly conveyed and addresses the "big problem".
Presentation	<ul style="list-style-type: none"> Student communicated the purpose and use of their farming innovation somewhat clearly. Student used minimal media to share their innovation and solution to their "big problem" in farming. Presentation ran too long/short. 	<ul style="list-style-type: none"> Student communicated the purpose and use of their farming innovation clearly. Student reasonably used media to share their innovation and solution to their "big problem" in farming. Presentation was a bit long/short. 	<ul style="list-style-type: none"> Student spoke well and clearly communicated the purpose and use of their farming innovation in detail. Student utilized media to effectively share their innovation and solution to their "big problem" in farming. Presentation was reasonably timed. 	<ul style="list-style-type: none"> Student spoke with confidence and communicated the purpose and use of their innovation in detail. Student more than one form of media to effectively share their innovation and solution to their "big problem" in farming. Presentation was reasonably timed.
Understanding of the Carbon Cycle	<ul style="list-style-type: none"> Student demonstrated little understanding of the Carbon Cycle and their innovation somewhat addressed the issue of carbon and climate stewardship in their presentation. 	<ul style="list-style-type: none"> Student demonstrated some understanding of the Carbon Cycle and their innovation somewhat addressed the issue of carbon and climate stewardship in their presentation. 	<ul style="list-style-type: none"> Student demonstrated clear understanding of the Carbon Cycle and their innovation clearly addressed the issue of carbon and climate stewardship in their presentation. 	<ul style="list-style-type: none"> Student demonstrated deep understanding of the Carbon Cycle and their innovation clearly and effectively addressed the issue of carbon and drew detailed attention to climate stewardship in their presentation.

NAME: DATE:

EXPLORING CAREERS connected to the ONTARIO DRY BEAN INDUSTRY

Consider the following and select ONE career from the list in **Handout 3B: CAREER DESCRIPTIONS** to research and share with the class.

*Which career might connect with your own passions/interests?
Which career is brand new to me that I would like to learn more about?*

Gather all of the information you can about your selected career:

- A description of the career - elaborate on the various roles & responsibilities of that career, paying special attention to how the career specifically relates to Ontario's Dry Bean Industry and expanding to look at it from how it fits into Canada's Ag Sector as a whole.
- List the educational pathways (schools/training programs) that lead to that career.
- Explore stories and gather any articles or firsthand accounts of people who work in that career - especially in Ontario's Dry Bean Industry.
- Include any current research, data or statistical information that might enhance your presentation.
- Share your personal response to the following:
 - Why is this career important to Ontario's Dry Bean Industry?
 - What do you personally find interesting about this career?
 - How does it align or connect with any of your personal skills and gifts?
 - Could you ever see yourself working in Agriculture? Why or why not?

Create a presentation that showcases your career and engages your peers in a relevant, engaging way:

- Use posterboard or a presentation board to put together a colourful, engaging display with all of your information.
- OR
- Create a multimedia presentation using various photos/graphics and/or video and a digital software program that can be used in an in-class or online oral presentation.

Use **Handout 3C: Evaluation Rubric** to guide your path to success in this unit.

Use **Handout 3D: Peer Evaluation & Self Reflection** to reflect on your learning in this unit.



NAME:

DATE:

CAREER DESCRIPTIONS

Agricultural Business Pathway:

Agricultural Accountant - help in the preparation and examination of financial records and play a role in ensuring taxes are paid and accurate financial records are kept.

Agricultural Journalist - they report and write features that will be found relevant by those involved in agriculture, but stories may also be seen by non-ag readers.

Agricultural Educator - responsible for the education of agriculture, food science, and natural resources for students.

Commercial Business Manager - utilize a variety of techniques to ensure that clients are satisfied and that their needs are met. They also support those in sales/management roles to ensure that sales targets are achieved.

Communications Manager - someone who prepares communications and supports management with media liaison/releases, speeches and promotional materials.

Crop Input Sales Rep - someone with plant science training who sells products to farms and businesses to help improve crop yields.

Data Processor - provides administrative support for the capture and transfer of information for storage, processing or transmitting.

Farm Equipment Sales - someone who sells farm equipment to farms or farming supply companies.

Farm Manager - responsibilities include monitoring staff, crops, purchasing supplies, preparing budgets and reports, and ensuring growth and vitality of the farm.

Field Marketer - responsible for sales and service of crop inputs and procurement of food grade contracts.

Food Products Manager - responsible for merchandising and exporting commodities (beans).

Government Sector Specialist - government representative who oversees various areas in Ag.

Information Technology (IT) Specialist - supports offices in all aspects of technology use by employees.

Information Technology (IT) Analyst - supports the analytical needs of a business through the analysis of moderately complex system data and summary reports.

Marketing Specialist - responsible for getting the appropriate communication message and medium delivered to the public.

Office Manager - responsible for handling administrative and customer service duties in an office setting.

Production Manager - responsible for overseeing day to day activities as they relate to the successful production of the product the company produces.

Purchasing Category Manager - purchases crops for use in canning and freezing processes.

Social Media Strategist - develop, manage and track internet content on their employer's social media pages.

Warehouse/Facility Manager - in charge of supervising staff, security, processes and procedures.

Agricultural Mechanics Pathway:

• **Carpenter/Labourer** - maintenance, mechanic and carpentry duties.

• **Custom Application Equipment Operator** - operating and maintaining agricultural equipment for chemical/fertilizer application.

• **Electrician** - installation and maintenance of mechanical equipment in electrical systems.

• **Maintenance/Service Technician** - making repairs on agricultural implements and equipment.

• **Processing Operator** - operating a variety of automated and semi-automated equipment to sort, clean, package and ship product (beans).

• **Truck Driver** - point of contact for receiving, transporting, and delivering products within the ag industry.

• **Welder** - welding equipment, machines and steel framework for buildings.

Food Science Pathway:

• **Food Safety/Quality Assurance Manager** - abide by regulatory authorities by implementing policies, strategies, and methodology testing.

• **Food Stylist** - designs, prepares and styles food for photography and/or on-air demonstration.

• **Nutritionist/Dietician** - advise clients on healthy food selection and the alteration of diets to achieve their nutrition and diet needs and goals.

• **Research & Development Technician** - assists a researcher or research team with product development projects.

Plant Science Pathway:

• **Agronomist** - provides agronomic knowledge and leadership to growers in their assigned market while performing job duties such as field scouting, soil management and market analysis.

• **Bean Breeder** - develop new and improved asparagus varieties with superior agronomic characteristics, and enhanced quality and yield.

• **Crop Scout** - inspects farmers' fields and records weed, insect, disease and other observations.

• **Plant Biologist** - specializes in topics such as plant breeding or genetics; they conduct and support research of plant production.

• **Research & Development Manager** - oversee research activities and develop knowledge-based products for a company.

• **Crop Producer/Farmer** - plants and harvests traditional row crops such as Ontario Dry Beans either independently or for a larger farm or cooperative.

• **Soil Scientist** - analyze characteristics of soil, the different soil types, and research the ability to survive in differentiated conditions.

NAME:

DATE:

Bean Farming Career Fair

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
Career Research	<ul style="list-style-type: none"> Research is incomplete, some roles and responsibilities are identified. How career connects to Bean Farming & the Ag Industry is basic or unclear. 	<ul style="list-style-type: none"> Research is complete, most roles and responsibilities are identified. How career connects to Bean Farming & the Ag Industry is somewhat clear. 	<ul style="list-style-type: none"> Research is thorough, roles and responsibilities are clearly identified. How career connects to Bean Farming & the Ag Industry is clear. 	<ul style="list-style-type: none"> Research is thorough, roles and responsibilities are clearly identified in great detail. How career connects to Bean Farming & the Ag Industry is clear and detailed.
Communication	<ul style="list-style-type: none"> Writing uses some of the appropriate literary conventions for descriptive and informative writing. Writing has several spelling and grammar errors. 	<ul style="list-style-type: none"> Writing uses most of the appropriate literary conventions for descriptive and informative writing. Writing has some spelling and grammar errors. 	<ul style="list-style-type: none"> Writing uses all of the appropriate literary conventions for descriptive and informative writing. Writing is generally free of spelling and grammar errors. 	<ul style="list-style-type: none"> Writing uses all of the appropriate literary conventions for descriptive and informative writing. Writing is free of spelling and grammar errors.
Presentation	<ul style="list-style-type: none"> Student communicated the roles and responsibilities of their career somewhat clearly. Student used minimal media to share their career. Presentation ran too long/short. 	<ul style="list-style-type: none"> Student communicated the roles and responsibilities of their career. Student reasonably used media to share their career. Presentation was a bit long/short. 	<ul style="list-style-type: none"> Student spoke well and clearly communicated the roles and responsibilities of their career. Student utilized media effectively to share their career. Presentation was reasonably timed. 	<ul style="list-style-type: none"> Student spoke confidently and clearly communicated the roles and responsibilities of their career. Student used more than one form of media effectively to share their career. Presentation was well-timed.
Peer & Self-Reflection	<ul style="list-style-type: none"> Student demonstrated some active listening skills and provided a little feedback on their peer review. Student demonstrated some engagement with the unit content in their self-reflection. 	<ul style="list-style-type: none"> Student demonstrated active listening skills and provided some feedback on their peer review. Student demonstrated an acceptable level of engagement with the unit content in their self-reflection. 	<ul style="list-style-type: none"> Student clearly demonstrated active listening and provided clear feedback on their peer review. Student clearly demonstrated quality engagement with the unit content in their self-reflection. 	<ul style="list-style-type: none"> Student clearly demonstrated active listening and provided quality and beneficial feedback on their peer review. Student clearly demonstrated deep engagement with the unit content in their self-reflection.

NAME: DATE:

VOCABULARY

CARBON CYCLE - the series of processes by which carbon compounds are interconverted in the environment.

CARBON FOOTPRINT - the amount of carbon dioxide and other carbon compounds emitted due to the consumption of fossil fuels by a particular person, group, etc.

CARBON SEQUESTRATION - the process of capturing and storing atmospheric carbon dioxide.

CASH CROP - a crop produced for its commercial value rather than for use by the grower.

CYGON - a systemic insecticide registered for use on several crops to control pests such as grasshoppers, aphids, leafhoppers and spider mites.

FIBRE - also known as "dietary fibre", is the part of the plant foods that the body cannot digest; it helps with bowel regularity, lowers blood cholesterol levels, and helps you feel fuller longer.

LEGUMES - a family of plants that produce a pod with seeds inside.

NEONICOTINOID - a class of neuro-active insecticides that act on certain receptors in the nerve synapses of pests, including leafhoppers.

NO-TILL - a method of farming for growing crops or pasture without disturbing the soil through tillage in order to decrease soil erosion and increase carbon-sequestration.

OMAFRA - Ontario Ministry of Agriculture, Food and Rural Affairs - the provincial ministry responsible for the food, agriculture and rural sectors of Ontario.

PMRA - Pest Management Regulatory Agency - the Canadian government agency responsible for the regulation of pest control products in Canada under the federal authority of the Pest Control Products Act and Regulations. This agency is a branch that reports directly to Parliament through Health Canada.

PLANT-BASED PROTEIN - a meaningful food source of protein which is found in plants (including pulses, tofu, soya, nuts, seeds, certain grains, peas, etc).

PROTEIN - a macronutrient that is essential to building muscle mass and providing energy to the body.

PULSES - pulses are the dried, edible seeds of certain plants in the legume family.

SOIL EROSION - the wearing away of a field's topsoil by the natural physical forces of water and wind, or through forces associated with farming activities, such as tillage.

TILLAGE - the agricultural preparation of soil by mechanical agitation of various types, such as digging, stirring, and overturning.

