



BC Agriculture in the Classroom Foundation

Spuds in Tubs

Potatoes – A “Perfect Food” Package?

Students will investigate the nutritional value of potatoes, and use this information gathered to answer the question of whether humans can live exclusively off potatoes without suffering from nutrient deficiencies or health complications. Students will reveal their final results in an oral presentation to the class.

Subject Levels/ Suggested Grade

Grade 9 English

Grade 9/10 Food Studies

Grade 9/10 Physical and Health Education

Grade 9 Social Studies

Written by Amy Stafford, BCAITC Education Specialist (2018-19)

Grade Subject	Curricular Competencies	Content Connections
Grade 9 English	<p>Access information and ideas for diverse purposes and from a variety of sources and evaluate their relevance, accuracy, and reliability.</p> <p>Synthesize ideas from a variety of sources to build understanding</p> <p>Exchange ideas and viewpoints to build shared understanding and extend thinking.</p> <p>Use writing and design processes to plan, develop, and create engaging and meaningful literary and information texts for a variety of purposes and audiences.</p>	<ul style="list-style-type: none"> • Reading strategies (using contextual clues, questioning, predicting, summarizing and making inferences). • Oral language strategies (focusing on the speaker, asking questions to clarify, expressing opinion, taking turns). • Features of oral language (volume, tone, pace, inflection, gestures). • Presentation techniques (reflects an appropriate choice of medium for the purpose and the audience, demonstrates care and organization).
Grade 9 Food Studies	Engage in a period of research and empathetic observation in order to understand design opportunities.	<ul style="list-style-type: none"> • Health, economic and environmental factors that influence availability and choice of food in personal, local, and global contexts. • Ethical issues related to food systems. • Relationship between eating practices and mental and physical wellbeing.
Grade 10 Food Studies	Analyze impacts of competing social, ethical, economic, and sustainability factors on food choice and preparation.	<ul style="list-style-type: none"> • Food trends, including nutrition, marketing and food systems. • Simple and complex global food systems and how they affect food choices.
Grade 9 Physical and Health Education	<p>Propose healthy choices that support lifelong health and wellbeing.</p> <p>Identify factors that influence health messages from a variety of sources and analyze their influence on behavior.</p>	<ul style="list-style-type: none"> • Potential short and long term consequences of health decisions, including those involving nutrition. • Sources of health information.
Grade 10 Physical and Health Education	Analyze and explain how health messages might influence health and wellbeing.	<ul style="list-style-type: none"> • Potential short and long term consequences of health decisions, including those involving nutrition. • Sources of health information.
Grade 9 Social Studies	<p>Use Social Studies inquiry processes and skills to ask questions; gather, interpret and analyze ideas; and communicate findings and decisions.</p> <p>Explain and infer different perspectives on past or present people, places, issues, or events by considering prevailing norms, values, worldviews, and beliefs.</p>	<ul style="list-style-type: none"> • Physiographic features of Canada and geological processes • Global demographic shifts, including patterns of migration and population growth

Teacher Background

Potatoes are edible tubers (stem growths) that are a part of the Nightshade family of plants. They come in many colours, shapes, and sizes, including the Warba variety of new nugget potatoes used in the Spuds in Tubs program. The potato was initially cultivated in South America by the Inca peoples around 8000 BCE, and was first transported to Europe in 1536 following exploration and conquest missions by the Spanish Conquistadors in Peru. Although it would take nearly 50 years for the potato to grow in popularity in Europe, it quickly replaced other staple crops such as wheat and oats due to its ease of growth and cultivation, and higher nutritional value. Potatoes are now considered an international crop, grown in many parts of the world and used in a variety of dishes. In BC, potatoes are primarily grown in the lower half of the province, including the Lower Mainland, Vancouver Island, Okanagan and Kootenay regions. BC produces approximately 78,000 tonnes of potatoes each year, and is ranked 8th in potato production by province in Canada.

Nutritionally speaking, potatoes are very highly ranked, included with other “super foods” such as kale, blueberries and salmon. One medium sized potato contains approximately 100 calories, 0 of which come from fat. Potatoes are free from cholesterol and sodium, when eaten on their own. Potatoes contain approximately 3g of dietary fibre, 4g of protein and have 26g of total carbohydrates, 3g of which is from sugars. Potatoes are also high in vitamins and minerals needed for overall health – meeting the following % daily values: 2% Calcium, 45% Vitamin C, and 6% Iron (all statistics based on a 2000 calorie diet). Potatoes are also noted for being high in potassium, Vitamin B6, and folic acid.

These high nutritional rankings come with a host of additional health benefits not listed on traditional nutritional labels. Potatoes are high in substances called phytonutrients, which are organic compounds found in many plants that can lead to improved health and wellbeing. Phytonutrients commonly found in various potato varieties include carotenoids, flavonoids and caffeic acid. Phytonutrients are thought to possibly lower blood pressure and reduce the risk of heart disease and stroke, and despite the high carbohydrate levels, many people do not gain excess weight through simply prepared potato consumption.

Because of these positive statistics, potatoes are sometimes considered to be a “perfect food” – one that is nutritionally dense enough for humans to survive exclusively off this product. However, potatoes also have some nutritional drawbacks. Although the high carbohydrate makeup of potatoes lends them to being easily digestible, they also contribute to a high glycemic index – meaning that eating potatoes causes rapid surges and crashes in blood sugar levels, which could possibly lead to increased insulin production. By limiting the diet to just potatoes, it would be impossible to get all 20 essential amino acids and 30 vitamins and minerals needed for human survival (even if white potatoes are combined with sweet potatoes). In addition, many preparation methods for eating potatoes – including frying, mashed, and baked with toppings – involve the additions of fats, salt and calories that do not contribute to health and wellbeing.

The purpose of this assignment is to challenge student perceptions of what they view as healthy food. By examining the specific elements of one food, students will be able to better understand nutritional labelling systems, assess their overall value when determining healthy choice making and communicating the results to their classmates. This activity allows students to begin explorations into “fad” diets, and some of the marketing techniques used to promote or degrade food products.

This lesson and activity are designed to be completed as part of the Spuds in Tubs growing program through BCAITC. For more information on this program please visit www.bcaitc.ca and look up Spuds in Tubs under the Programs tab.

Materials

- Electronic Devices and Internet Access
- BCAITC website – Spuds in Tubs Resource links
- Presentation Rubric
- Student handouts:
 - Perfect Potato Nutritional Chart

Procedure

1. Introduction/Hook → Desert Island Simulation
 - a. Introduce students to the topic of “perfect” foods using this activity. Have students complete a Think, Pair, Share brainstorm answer to the following question: **You are stranded on a desert island with no hope of being rescued. However, you are granted an unlimited supply of one food (and water) to keep you alive. You cannot supplement this food with sea or land creatures, and there is no plant life on the island. What food do you choose to keep you alive?** Student answers will vary, but likely involve food with multiple ingredients such as pizza. Challenge students to repeat the round choosing a single ingredient food, such as kale or salmon. Have them explain their reasoning for their choices, and record for later use as possible criteria for judgement.
 - b. Explain to students that this simulation is to introduce the idea of “perfect foods” – foods that are nearly nutritionally complete for humans, without additional foods. In theory, humans should be able to survive off of these “perfect foods” with few health issues. Your challenge to the students is to do more extensive research into one of these “perfect foods” – the potato – to find out the accuracy of these claims.
2. Potato Nutritional Label Research
 - a. Give each student the Perfect Potato Nutritional Chart handout, and explain the breakdown of each section. Encourage students to use the Grow BC resource sheet on Potatoes. Allow students some time to research and fill their labels.
 - b. Mark as a class to ensure accuracy for presentation purposes, using the Grow BC resource sheet.
3. Is the potato a perfect food?
 - a. Once students have completed their labels, have them conduct research in small groups to answer the question about whether or not the potato should be considered a “perfect food”. They will be presenting their research and group answer to their classmates.
 - b. Encourage students to use resources such as the Grow BC resource sheet, the Canada Food Guide for serving recommendations, and other online resources. It may be beneficial to have a conversation about reliable vs. unreliable online sources when students are conducting their research.
4. Presentation Preparation
 - a. Allow at least one class period for research and one for presentations. Students should look for research evidence both for and against the potato being considered a perfect food, and be prepared to present their findings in an interesting way (skit, video, commercial, etc.)

- b. Guiding questions may be needed to direct student research. The following list gives some suggestions for focusing student thought:
- i. What are the essential nutrients humans need to live? How many of these can be found in potatoes?
 - ii. How many potatoes would we need to consume to reach our daily intake needs for nutrients and calories?
 - iii. Have people survived on only potatoes in the past? Why or why not?
 - iv. Are there any health problems associated with eating nothing but potatoes?

Extension Activities

- Have students compare the nutritional values of other “perfect” or “super” foods, and compare as a class to come up with the top contender
- Challenge students to come up with a week of potato only diet food – including different preparations techniques that involve a minimum of additives (fats, salt, or dairy)
- Research potato varieties, including the Warba – is there one who rises above all other potatoes?
- Research further into groups, such as Irish peasants, or specific people who have lived on a potato only diet, and make hypothesizes for the long term implications of these diets (overall health, social restrictions, food security)
- Look into the uses and cultivation of potatoes or other tubers in Indigenous culture – how are they similar or different to European uses and cultivation?

Credit:

- The image of the potato nutritional label was taken from the Idaho Potato Commission as it was the most comprehensive online label <https://idahopotato.com/nutritional-facts>. For a breakdown of nutritional information for BC varieties, please visit <https://bcfresh.ca/potatoes/> Information may vary slightly based on potato variety.
- This lesson is based off the Popular Science article “Is there a single food that you can survive on forever?” by Ellen Airhart <https://www.popsoci.com/nutrition-single-food-survival>

Potato Nutritional Facts Worksheet

Name: _____

Date: _____

Nutrition Facts	
Serving size 1 potato (148g/5.2oz)	
Amount per serving	
Calories	
% Daily Value*	
Total Fat	__ g %
Saturated Fat	__ g %
Trans Fat	__ g
Cholesterol	__ mg %
Sodium	__ mg %
Total Carbohydrate	__ g %
Dietary Fiber	__ g %
Total Sugars	__ g
Includes 0g Added Sugars %	
Protein	__ g
Vitamin D	__ mg %
Calcium	__ mg %
Iron	__ mg %
Potassium	__ mg %
Vitamin C	__ mg %
Vitamin B ₆	__ mg %

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

____/30

Potato Nutritional Facts Worksheet

Name: _____ KEY _____

Date: _____

Nutrition Facts

Serving size **1 potato (148g/5.2oz)**

Amount per serving

Calories

110

% Daily Value*

Total Fat 0g

0%

Saturated Fat 0g

0%

Trans Fat 0g

Cholesterol 0mg

0%

Sodium 0mg

0%

Total Carbohydrate 26g

9%

Dietary Fiber 2g

7%

Total Sugars 1g

Includes 0g Added Sugars

0%

Protein 3g

Vitamin D 0mcg

0%

Calcium 20mg

2%

Iron 1.1mg

6%

Potassium 620mg

15%

Vitamin C 27mg

30%

Vitamin B₆ 0.2mg

10%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

Potato Nutritional Facts Rubric

Names: _____

Date: _____

CATEGORY	Fully Meeting (4)	Mostly Meeting (3)	Minimally Meeting (2)	Not Yet Meeting (1)
Preparedness	Student is completely prepared and has obviously rehearsed.	Student seems pretty prepared but might have needed a couple more rehearsals.	The student is somewhat prepared, but it is clear that rehearsal was lacking.	Student does not seem at all prepared to present.
Content	Shows a full understanding of the topic.	Shows a good understanding of the topic.	Shows a good understanding of parts of the topic.	Does not seem to understand the topic very well.
Collaboration with Peers	Almost always listens to, shares with, and supports the efforts of others in the group. Tries to keep people working well together.	Usually listens to, shares with, and supports the efforts of others in the group. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others in the group but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others in the group. Often is not a good team member.
Listens to Other Presentations	Listens intently. Does not make distracting noises or movements.	Listens intently but has one distracting noise or movement.	Sometimes does not appear to be listening but is not distracting.	Sometimes does not appear to be listening and has distracting noises or movements.

Total ____/16