

## **Picture-Perfect Potatoes;** a Spuds in Tubs Program Unit for Middle School Students Using a Project-based Learning Approach

Created by Gurinder Cheema, B.A., B.Ed., M.Ed.  
Education Specialist, BCAITC

**With additions made by:**

Nadia Lee, B.Ed., M.Ed.

ELL and Learning Services Teacher, Colleen & Gordie  
Howe Middle School

Craig Hemmerich, B.Sc., B.Ed., PBD.

Grade 8 Teacher, Colleen & Gordie Howe Middle School

**Suggested Subject Area(s):**

Language Arts 6, 7, 8

Social Studies 6, 7, 8

Physical and Health Education 6, 7, 8

Mathematics 6, 7, 8

Science 6, 7, 8

Home Economics and Foods 6, 7, 8

Visual Arts 6, 7, 8

**\*Please note:** This unit is meant to be taught alongside the BC Agriculture in the Classroom Foundation's Spuds in Tubs Program.  
Find Program specifics at <http://aitc.ca/bc/programs/spuds-in-tubs-2/>

**The Big Question:** How does growing potatoes connect me to my community today, in the past and in the future?



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## BC Ministry of Education 2014 Curriculum Competencies covered through this program:

(Downloaded October 2014, from <https://curriculum.gov.bc.ca/>)

**Communication:** encompasses the set of abilities that students use to impart and exchange information, experiences and ideas, to explore the world around them, and to understand and effectively engage in the use of digital media.

**Thinking:** encompasses the knowledge, skills and processes we associate with intellectual development. Through this competency as thinkers, students take subject-specific concepts and content and transform them into a new understanding. Thinking competence includes specific thinking skills as well as habits of mind, and metacognitive awareness.

**Personal and Social:** the set of abilities that relate to students' identity in the world, both as individuals and as members of their community and society. This competency encompasses the abilities students need to thrive as individuals, to understand and care about themselves and others, and to find and achieve their purposes in the world.

### Ministry of Education Curriculum Draft (2014) that can be covered:

**English Language Arts 6 - 7:** Students will be able to develop the following curricular competencies using oral, written, visual, and digital texts.

- Apply a variety of reading and critical thinking strategies to increase comprehension and construct meaning
- Engage actively as readers and listeners to construct meaning, deepen thinking and comprehension, and promote inquiry
- Read, view, and listen to a variety of text types and genres, including those of Aboriginal origin
- Make meaningful personal connections with a variety of texts to increase understanding of self and others
- Appreciate the universal importance of story in Aboriginal, Canadian, and other cultures
- Consider multiple perspectives, voices, values, beliefs, and bias in texts from a variety of cultures, including Aboriginal ones
- Examine texts that are representative of various social and historical contexts
- Support thinking using relevant evidence, personal connections, and background knowledge
- Explore and express ideas, opinions, and perspectives to communicate clearly through oral language
- Use the writing process to improve clarity
- Create a variety of personal, informational, and imaginative texts according to purpose and audience
- Use language creatively to express ideas, evoke emotion, and create impact
- Compare ideas encountered in a variety of texts and genres

**English Language Arts 8 - 9:** Students will be able to develop the following curricular competencies using oral, written, visual, and digital texts.

- Identify and use reading strategies to increase comprehension
- Make meaningful personal connections with ideas presented in a variety of texts to increase understanding of self and others
- Engage actively as readers and listeners to construct meaning, deepen thinking and comprehension, and promote inquiry
- Appreciate the universal importance of story in Aboriginal and other cultures
- Examine text in relation to social, historical, and cultural contexts
- Demonstrate an understanding of how story supports the well-being of the self, the family, and the community in Aboriginal and other cultures
- Examine ideas or information presented in a variety of texts to increase understanding
- Analyzing the accuracy, reliability, and relevance of information
- Use oral language to explore and express ideas, communicate clearly, and evoke emotion
- Apply the conventions of language to clarify meaning in written and oral communication
- Refine form and structure according to purpose, audience, and context
- Assess and adjust communication to improve its clarity, effectiveness, and impact
- Develop and defend a position with supporting evidence
- Create a variety of texts to communicate ideas, create impact, and evoke emotion

**Social Studies 6:** Students will develop competencies needed to be active, informed citizens:

- Use Social Studies inquiry processes (ask questions, gather, interpret and analyze ideas, and communicate findings and decisions)
- Determine what is significant in an account, narrative, map, or text (significance)
- Assess and compare the significance of people, places, events, and/or developments over time and place (significance)
- Corroborate inferences about the content and origins of multiple sources (evidence)
- Recognize the positive and negative aspects of continuities and changes for different groups in the past and present (continuity and change)
- Explain different perspectives on a past or present event or issue, including how changing values, worldviews, and beliefs have influenced perspectives (perspective)
- Recognize and classify different value judgments, including ethical judgments, in a variety of sources (ethical judgment)

**Social Studies 7:** Students will develop competencies needed to be active, informed citizens:

- Use Social Studies inquiry processes (ask questions, gather, interpret and analyze ideas, and communicate findings and decisions)
- Assess and compare the significance of people, places, events, and/or developments over time and place and from different perspectives (significance)

- Ask questions and corroborate inferences about the content and origins of multiple sources (evidence)
- Explain different perspectives on a past or present event or issue, including how changing values, worldviews, and beliefs have influenced perspectives (perspective)
- Recognize and classify different value judgments, including ethical judgments, in a variety of sources (ethical judgment)

**Social Studies 8:** Students will develop competencies needed to be active, informed citizens:

- Use Social Studies inquiry processes (ask questions, gather, interpret and analyze ideas, and communicate findings and decisions)
- Explain different perspectives on past or present people, places, issues, and events, and distinguish between worldviews of today and the past (perspective)
- Recognize implicit and explicit ethical judgments in a variety of sources (ethical judgment)
- Make reasoned ethical judgments about controversial actions in the past and present after considering the context and standards of right and wrong (ethical judgment)

**Physical and Health Education 6:** Students will develop competencies needed to be healthy and active citizens.

- Identify and describe factors, including social pressures, that influence personal health choices, goal-setting and decision-making
- Describe ways to access and evaluate information and support services for a variety of health topics

**Physical and Health Education 7:** Students will develop competencies needed to be healthy and active citizens.

- Analyze factors that influence our health decisions
- Identify and describe factors that influence personal health choices; goal-setting, and decision-making
- Describe ways to access and evaluate information and support services for a variety of health topics
- Describe strategies for promoting wellness

**Physical and Health Education 8:** Students will develop the competencies needed to be healthy and active citizens.

- Demonstrate an ability to apply a goal-setting or decision-making model to a specific situation
- Assess the content, origins, and purpose of information about safety and health topics
- Describe strategies for promoting wellness

**Mathematics 6:** Students will be able to problem solve. Inductively and deductively reason and use logic to explore, make connections, predict, analyze, generalize, and make conclusions.

- Communicate concretely, pictorially, symbolically, and using spoken and written language to express, describe, explain, represent, clarify, modify, reinforce, apply, defend and extend mathematical ideas

- Visualize and describe mathematical concepts
- Connect mathematical concepts to each other and make mathematical connections to the real world
- Develop mathematical understanding through concrete, pictorial, and symbolic representations
- Use technology appropriately to explore and create patterns, examine relationships, test conjectures, solve problems, record, and communicate and represent thinking.

**Mathematics 7:** Students will be able to problem solve.

- Inductively and deductively reason and use logic to explore, make connections, predict, analyze, generalize, and make conclusions
- Communicate concretely, pictorially, symbolically, and using spoken and written language to express, describe, explain, represent, clarify, modify, reinforce, apply, defend and extend mathematical ideas
- Visualize and describe mathematical concepts
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- Develop mathematical understanding through concrete, pictorial, and symbolic representations
- Use technology appropriately to explore and create patterns, examine relationships, test conjectures, solve problems, record, communicate and represent thinking

**Mathematics 8:** Students will be able to problem solve.

**Science 6:** Students will be able to inquire by:

- Make observations in familiar or unfamiliar contexts
- Identify questions to answer or problems to solve through scientific inquiry
- Make predictions about what the findings of their inquiry will be
- With support, plan appropriate investigations to answer their questions or solve problems they have identified
- Decide which variable should be changed and measured for a fair test
- Choose appropriate data to collect to answer their question
- Observe, measure, and record data, using appropriate tools, including digital technologies
  - Construct and use a variety of methods, including tables, graphs, and digital technologies as appropriate, to represent patterns or relationships in data
  - Compare data with predictions and develop explanations for results
  - Demonstrate an openness to new ideas and a consideration of alternatives
  - Identify possible sources of error

**Science 7:** Students will be able to inquire by:

- Make observations aimed at identifying their own questions about the natural world
- Identify a question to answer or a problem to solve through scientific inquiry

- Make predictions about what the findings of their inquiry will be
- In fair tests, measure and control variables
- Observe, measure, and record data, using equipment, including digital technologies, with accuracy appropriate to the task
- Construct and use a range of methods to represent patterns or relationships in data, including tables, graphs, key, scale models, and digital technologies as appropriate
- Use scientific understandings to identify relationships and draw conclusions
- Reflect on their investigation methods, including the adequacy of controls on variables and the quality of the data collected
- Identify possible sources of error and suggest improvements to their investigation methods

**Science 8:** Students will be able to inquire by

- Make observations aimed at identifying their own questions about the natural world
- Identify a question to answer or a problem to solve through scientific inquiry
- Make predictions about what the findings of their inquiry will be
- In fair tests, measure and control variables
- Observe, measure, and record data, using equipment, including digital technologies, with accuracy appropriate to the task
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- Use scientific understandings to identify relationships and draw conclusions
- Reflect on their investigation methods, including the adequacy of controls on variables and the quality of the data collected
- Identify possible sources of error and suggest improvements to their investigation methods

**Arts Education (Visual Arts) 6, 7:** Students will be able to use a variety of creative processes to create and respond to the arts:

- Intentionally select and apply materials, environments, tools, and principles to combine and arrange artistic elements, processes, and techniques in art making
- Create artistic works collaboratively and as an individual using ideas inspired by imagination, inquiry, experimentation, and purposeful play

**Arts Education (Visual Arts) 8:** Students will be able to use a variety of creative processes to create and respond to the arts:

- Intentionally select and apply materials, environments, tools, and techniques by combining and arranging elements, processes, and principles
- Create artistic works collaboratively and as an individual using ideas inspired by imagination, inquiry, experimentation, and purposeful play

## Ministry of Education IRP's (2010) that can be covered:

### English Language Arts 6:

- A1 use speaking and listening to interact with others for various purposes
- A2 use speaking to explore, express, and present a range of ideas, information, and feelings for different purposes and audiences
- A3 listen purposefully to understand and analyze ideas and information,
- A4 select and use strategies when interacting with others
- A5 select and use strategies when expressing and presenting ideas, information, and feelings
- A6 select and use strategies when listening to make and clarify meaning
- A9 use speaking and listening to improve and extend thinking
- B1 read fluently and demonstrate comprehension of a range of grade appropriate literary texts, featuring variety in theme and writing techniques
- B2 read fluently and demonstrate comprehension of grade appropriate information texts, with some specialized language
- B6 select and use strategies during reading and viewing to construct, monitor, and confirm meaning
- B7 select and use strategies after reading and viewing to confirm and extend meaning, including
- C1 write a variety of clear, focused personal writing for a range of purposes and audiences that demonstrates connections to personal experiences, ideas, and opinions
- C2 write a variety of effective informational writing for a range of purposes and audiences that communicates ideas to inform or persuade
- C4 create meaningful visual representations for a variety of purposes and audiences that communicate personal response, information, and ideas relevant to the topic

### English Language Arts 7:

- A1 use speaking and listening to interact with others for various purposes
- A3 listen critically to understand and analyze ideas and information
- A4 select and use various strategies when interacting with others
- A5 select and use various strategies when expressing and presenting ideas, information, and feelings
- A6 select and use various strategies when listening to make and clarify meaning
- B7 select and use various strategies after reading and viewing to confirm and extend meaning
- C1 write a variety of clear, focused personal writing for a range of purposes and audiences that demonstrates connections to personal experiences, ideas, and opinions

### English Language Arts 8:

- A1 interact and collaborate in pairs and groups
- A2 express ideas and information in a variety of situations and forms

- A4 select and use a range of strategies to interact and collaborate with others in pairs and groups
- A10 speak and listen to synthesize and extend thinking
- C4 create thoughtful representations that communicate ideas and information

### Social Studies 6:

- A1 apply critical thinking skills –including comparing, classifying, inferring, imagining, verifying, identifying relationships, summarizing, and drawing conclusions – to a range of problems and issues
- A2 interpret graphs, tables, aerial photos, and various types of maps
- A4 deliver a formal presentation
- B1 assess diverse concepts of Canadian identity
- E1 assess the relationship between cultures and their environments

### Social Studies 7:

- A1 apply critical thinking skills – including comparing, classifying, inferring, imagining, verifying, using analogies, identifying relationships, summarizing, and drawing conclusions – to a range of problems and issues
- A2 use various types of graphs, tables, timelines, and maps to obtain or communicate information
- A4 deliver a formal presentation on a selected issue or inquiry using two or more forms of representation

### Social Studies 8:

- identify and clarify a problem, an issue, or an inquiry
- gather and organize a body of information from primary and secondary print and non-print sources, including electronic sources
- interpret and evaluate a variety of primary and secondary sources
- plan, revise, and deliver written and oral presentations
- co-operatively plan and implement a course of action that addresses the problem, issue, or inquiry initially identified
- compare the changing nature of labour in rural and urban environments
- describe the impact of technological innovation and science on political, social, and economic structures

### Health and Career Education 6:

- C1 describe the benefits of attaining and maintaining a balanced, healthy lifestyle, including the benefits of being physically active healthy eating practices, an emotionally healthy lifestyle

### Health and Career Education 7:

- C1 analyze factors (including media and peer) that influence personal health decisions
- C3 demonstrate an ability to access community information and support services for a variety of health issues

### Health and Career Education 8:

- set personal goals for attaining and maintaining a healthy lifestyle
- analyze influences on eating habits, including family, peers, and media

### Mathematics 6:

- A6 demonstrate an understanding of percent (limited to whole numbers) concretely, pictorially, and symbolically
- B2 represent and describe patterns and relationships using graphs and tables
- D1 create, label, and interpret line graphs to draw conclusions
- D2 select, justify, and use appropriate methods of collecting data
- D3 graph collected data and analyze the graph to solve problems

### Mathematics 7:

- B1 demonstrate an understanding of oral and written patterns and their equivalent linear relations
- B2 create a table of values from a linear relation, graph the table of values, and analyze the graph to draw conclusions and solve problems

### Mathematics 8:

- A3 demonstrate an understanding of percent greater than or equal to 0%

### Science 6:

- manipulate and control a number of variables in an experiment

### Science 7:

- test a hypothesis by planning and conducting an experiment that controls for two or more variables
- analyze the roles of organisms as part of interconnected food webs, populations, communities, and ecosystems
- assess survival needs and interactions between organisms and the environment

### Science 8:

- A2 perform experiments using the scientific method
- A3 represent and interpret information in graphic form
- B1 demonstrate knowledge of the characteristics of living things

### Arts Education (Visual Arts) 6:

- A4 manipulate selected materials, technologies, and processes to create images
- B3 analyze and use a variety of materials, technologies, and processes to create images

### Arts Education (Visual Arts) 7:

- A3 create images using the principle of unity to produce a variety of effects

- A4 create images using a variety of materials, technologies, and processes
- B3 analyze and apply a variety of materials, technologies, and processes to create artworks

### Arts Education (Visual Arts) 8:

- A4 manipulate selected materials, technologies, and processes to create images
- B3 analyze and use a variety of materials, technologies, and processes to create images

### Home Economics and Foods 8:

- C1 describe the importance of nutrition and other factors that contribute to health
- D1 describe factors that influence personal food choices

## Rationale for the Project

Project-based learning (PBL) is a method of teaching that is student-centered. It consists of introducing students to a goal-based activity with a clear purpose and end product in mind. The basic purpose of PBL is to evoke students into an insightful understanding of the subject through hands on learning activities and tasks rather than the traditional form of paper-pencil deskwork. PBL activities also ensure that students are engaged in the learning experience and have fun while learning.

There is also a specific topic or theme for the project, with students working towards completing the project in a collaborative working environment. In this type of cooperative setting, students have ample opportunities for communication in oral and written forms, whether spontaneously or teacher directed. Either way, the communication that takes place is based on authentic tasks and the conversation is therefore also authentic. Likewise, students become confident in their language abilities as they have many opportunities to read, write, listen and speak and delve into oral interaction.

The merits of implementing PBL into all classrooms are endless, especially for children with special needs or English Language Learners (ELLs). A major component of PBL is driving the natural peer communication that is required on a daily basis. It is this language focused component that makes PBL so important for ELLs. Research suggests PBL encourages students to work together, and speak frequently about the tasks at hand, thus allowing ELLs to engage in the subject matter and the language homogeneously. This type of learning takes the focus away from reaching rigid language targets and instead invites the use of multi-skill activities and hands-on task achievement.

Through Picture-Perfect Potatoes; a Spuds in Tubs Program Unit for Middle School Children, students will contribute to a meaningful project, where they are planting, growing, maintaining, and harvesting a tub of potatoes. Students will be responsible for maintaining their crops by hilling, watering, and feeding as needed inside and outside of allocated class time. Teachers can monitor the groups and their plants weekly, and provide feedback on the tasks completed. At the end of the project, students will create recipes for the potatoes they have produced following proper menu format with a focus on grammar and spelling. In addition to the research and development of background knowledge relating to potato farming in Canada and around the world, issues of healthy living, sustainable agriculture, and the 100 mile diet, students can read literary texts relating to the themes of food, nutrition, and the community garden, such as *Seedfolks*, by Paul Fleischman.

The unit will build sustainability into everyday living and learning and will promote environmental education. The focus of the project itself will be to develop research and data collection skills, basic

speaking and listening skills, and a cooperative learning classroom community. This unit also includes a research component where students will explore how potatoes come to their table: who grows them, who picks them, who packs them, how they are grown and why, including the history of potato growing in Canada and around the world. The bulk of the information gathering will happen at school through Internet research. The outcome of the project will be multifaceted; with the major component being a potato harvest and then preparing the potatoes for a classroom feast.

### References:

Alan, B. & Stoller, F. (2005). "Maximizing the Benefits of Project Work in Foreign language Classrooms," *English Teaching Forum* 43 (4): 10-21.

## Picture-Perfect Potatoes; a Spuds in Tubs Program Unit for Middle School Students Using a Project-based Learning Approach

**The Big Question:** How does growing potatoes connect me to my community?

### \*\*\*Terms and Vocabulary to scaffold during this Unit:

Aboriginal people	hypothesis	proposal	variable
average	life cycle	recipe	variety
classification	mass	revenue	volume
consumption	menu	storage	100 Mile Diet
decimal	nutrition	soil erosion	Eat Local
experimentation	obstacle	source of error	Zero Mile Diet
fraction	percentage	tally	
frequency	predator	trial	
harvest	prediction	vandalism	

## COMPLETE LESSONS #1 – LESSONS #7 BEFORE PLANTING YOUR SPUDS:

### Lesson #1: Exploring Potatoes

**Essential/Driving Question:** What do we know about potatoes?

#### Subjects Covered:

- Physical and Health Education 6, 7, 8
- Mathematics 6, 7, 8
- Science 6, 7, 8
- Home Economics and Foods 6, 7, 8

#### Materials/Preparation:

- Variety of potatoes (example: Russet, Red, Peruvian Blue, Yukon Gold, Fingerlings, Warba)
- Scale or balance to measure potatoes
- Internet access, Computer, Projector, Speakers
- Picture-Perfect Potatoes Booklet (Appendix 1)
- Rulers, Pencil Crayons or Markers, 3 different coloured pens

**Introduction/Objectives:** Students will link pre-existing with new knowledge of potatoes

- Ask students: What is a potato? Who has eaten potatoes before? Do you know where potatoes come from? How are they grown? Have you ever thought about the people who grow our potatoes? Are potatoes good for you?
- Students must complete their web (on Page 1 of Appendix 1) using one coloured pen
- Record answers on board (students add additional answers learned through peer responses to their brainstorm using a different coloured pen)
- Show one or both of these videos:
- [http://www.youtube.com/watch?v=3qCh8KZw\\_e0](http://www.youtube.com/watch?v=3qCh8KZw_e0) The Nutritional Benefits of Potatoes (1min, 40sec)
- [http://www.youtube.com/watch?v=qT3\\_\\_coWMFg](http://www.youtube.com/watch?v=qT3__coWMFg) Health Benefits of Potato (1min, 33secs)
- Students add new info to their webs using different coloured pen while watching videos

#### Application/Activity:

- Show students 5 different potatoes; for example: Russet, Red, Peruvian Blue, Yukon Gold, Fingerlings, Warba
- Ask students: Which of these do you usually eat or have you seen at home or in grocery stores?
- Students will observe each variety and complete the Picture-Perfect Potatoes Booklet (Appendix 1)

### Evaluation/Assessment:

- Assess if students were able to link new knowledge to pre-existing (Part A, Appendix 1)
- Assess Classification Charts (Part B, Appendix 1) for completion and accuracy of written work

### Homework/Assignment:

- Picture-Perfect Potatoes booklet (Appendix 1) due next class

### Closure/Extension:

- Students can go home and look through their pantry and try to find any potatoes they worked with today! (report back next class)

## Lesson #2: Exploring Potatoes continued...

**Essential/Driving Question:** What does it take to grow potatoes?

### Subjects Covered:

- Language Arts 6, 7, 8
- Social Studies 6, 7, 8
- Physical and Health Education 6, 7, 8
- Home Economics and Foods 6, 7, 8

### Materials/Preparation:

- Internet access, Computer, Projector
- Student Computers for Research via Mobile Lab or Computer Lab
- Reading Strategy (Appendix 2)
- Copy of story: Pete's Potato Angels by Alix MacNeil
- (Download from: <http://aitc.ca/bc/programs/spuds-in-tubs-2/spuds-program-resources/>)
- (Find it under Spuds in Tubs Supplement, Pete's Potato Angels)

**Introduction/Objectives:** Students will be able to understand aspects of potato farming in BC.

- Read Aloud: Pete's Potato Angels by Alix MacNeil as students follow along
- Have students complete the reading strategy (Appendix 2) while reading (stop at natural breaks in the story and allow them to record their ideas into each box)
- Ask students to share what they wrote in Box 1 and/or 4 of their reading strategy and discuss (collect)

## Application/Activity:

- In Groups, students will research more facts about potato farming in BC
- Each group will receive a topic that will focus on one aspect of potato farming
- The Topics researched will be:
  - Group 1 - Who is involved in growing potatoes: discuss geographic locations around BC, the farmers, variety of people needed from planting, harvesting, to processing, challenges they face.
  - Group 2 - How potatoes are grown: discuss varieties, life cycle of potato, steps needed at each stage.
  - Group 3 - What are the uses: discuss foods made with potatoes, nutritional value of potatoes in different recipes; i.e. Explore nutritional value of a raw potato compared to potato chips or French fries, steps taken to produce from raw to final product.
  - Group 4 - Share industry statistics: discuss tones produced, revenues generated, employment supported.
  - Group 5 - Explain difference between seed potato and table potato industry, importance of each, BCs involvement in each, can focus on Richmond.
- Direct students to website <http://aitc.ca/bc/programs/spuds-in-tubs-2/spuds-program-resources/> and go to Accompanying Resources Available for Download or Order
- Direct students to visit the various government pages listed that share facts and statistics about potato farming in BC (BC Potato Facts from Grow BC, BC Ministry of Agriculture – Potato Home Page, BC Ministry of Agriculture – Potato Fact Sheet, and Ontario Potato Board)
- Groups must be prepared to present their findings using different mediums of their choice; Power Point, Prezi, iMovie, Poster, Storyboard, Book Report, Pamphlet (due in two classes)

## Evaluation/Assessment:

- Evaluate reading strategy (Appendix 2) for connections with the story
- Evaluate on-task behavior during group research
- Create your own rubric for the group project criteria

## Homework/Assignment:

- Continue research at home if needed

## Closure/Extension:

- Research: Students may also explore the history of potato farming around the world, with a specific focus on The Irish Potato Famine (1845-1852), and its influences on potato farming today, immigration patterns in light of the famine etc.
- Research: Students may also explore how potatoes are currently significant in diets around the world
- Collaboration: students can make up group names; The Dirt Boys (they will work in these groups for the duration of this project)
- Connections: Students can discuss the potato story with their family and discover if they knew of this type of farming practice

## Lesson #3: Exploring Potatoes continued...

**Essential/Driving Question:** What does it take to grow potatoes?

### Subjects Covered:

- Language Arts 6, 7, 8
- Social Studies 6, 7, 8
- Physical and Health Education 6, 7, 8
- Home Economics and Foods 6, 7, 8

### Materials/Preparation:

- Internet Access, Computer, Projector
- Student Computers for Research via Mobile Lab or Computer Lab
- Poster Paper, Markers

**Introduction/Objectives:** Students will be able to understand potato farming in BC....

- Recall and Review elements of Pete's Potato Angels story
- Share with students the Delta Potato Story Power Point found at: <http://aitc.ca/bc/programs/spuds-in-tubs-2/spuds-program-resources/> and go to Spuds in Tubs Supplement, The Delta Potato Story
- Discuss/answer questions if needed

### Application/Activity:

- Review expectations for the research project: proper website research techniques, how to find quality sites, paraphrasing versus pasting, plagiarism...
- Review steps on how to create and/or share samples of a Power Point, Prezi, iMovie, Poster, Storyboard, Book Report, Pamphlet
- Students can continue research/creation of presentation item (due next class)

### Evaluation/Assessment:

- Evaluate on-task behavior during group research

### Homework/Assignment:

- Students must be prepared to present their findings next class

### Closure/Extension:

- Students may wish to meet afterschool to go over their presentations
- Students may divide up specific presentation parts and practice saying out their parts

## Lesson #4: Exploring Potatoes continued...

**Essential/Driving Question:** What does it take to grow potatoes?

### Subjects Covered:

- Language Arts 6, 7, 8
- Social Studies 6, 7, 8
- Physical and Health Education 6, 7, 8
- Home Economics and Foods 6, 7, 8

### Materials/Preparation:

- Computers, iPads, Internet Access, Projector
- Collaboration/Teamwork Rubric (Appendix 3)

**Introduction/Objectives:** Students will be able to understand potato farming in BC....

- Review expectations for respectful behavior while watching presentations
- Review criteria for the project

### Application/Activity:

- Groups will present their findings to the class by sharing their Power Point, Prezi, iMovie, Poster, Storyboard, Book Report, Pamphlet
- After presentations, each group member must complete a Collaboration/Teamwork Rubric on their role in the research, collaboration, presentation etc. (Appendix 3)

### Evaluation/Assessment:

- Evaluate on-task behavior during group presentations, ensure each member has played an equal part
- Cross reference their findings

### Homework/Assignment:

- Teacher must briefly go over proper interviewing techniques. (write out on the board)
- Students will interview their parents/guardians and grandparents and gather stories from their upbringing to gain a greater understanding of the past and present experiences of producing, accessing, preparing, storing, and consuming food; with a focus on potatoes. (5 Questions below)
- Students must interview 3 people and then record the data (answers to each question which will be added to a class tally next lesson)

### Questions to ask:

1. Where did you grow up? (North America, Asia, Africa, Australia, Antarctica, South America, Europe)
2. How did you get your food? (grow, gather, hunt, fish, trade, grocery store, other)
3. How was your food stored? (refrigerated, froze it, in a root cellar, salted and dried it, smoked it, canned, other)
4. What was your favourite potato recipe when you were a kid? (mashed, fried, boiled, baked, others)
5. Extra: What were some common holiday/festive traditions around food?

### Closure/Extension:

- In pairs, present a 'fake' interview with some made up and unique answers in front of the class.

## Lesson #5: What's your Potato Story?

**Essential/Driving Question:** How are food stories connected to the cultures of the people around you?

### Subjects Covered:

- Mathematics 6, 7, 8
- Language Arts 6, 7, 8
- Social Studies 6, 7, 8

### Materials/Preparation:

- 5 large charts on poster paper (see below for content)
- Thick markers
- Student notebooks and pencils

### Introduction:

- Display below chart on large poster paper at front of room.
- Frequency: Teach students the concept of frequency by showing them tallying.

- Count total number of students present in class today. Record on chart.
- Ask students: If you had to choose one of these colours, which one would be your favourite?
- Stand up if your favourite colour is... (one by one, call out colours and have students come up and tally their own answer onto the chart).
- Show students how to come up with frequency, fractions, decimals, and percentage at each colour.
- Students should have prior exposure to these concepts in Math class.
- Teacher should choose which concept to focus on/include according to current student levels.

Total # of students present in class today: \_\_\_\_\_

	Purple	Green	Blue	Red	Pink
TALLY					
Frequency					
Fraction					
Decimal					
Percentage					

### Application/Activity:

- At the front of the class, on large poster papers, each interview question and possible response should be charted and ready for input (see charts below)
- Students will copy these charts into their notebooks and input their HW responses.
- Students will input their responses on the large charts at front of class.
- Students will input all classmates' responses onto their charts.
- OR: Students can be directed to complete these charts into Spreadsheets using Microsoft Excel. This is up to individual teachers what method to use.
- Once all responses have been tallied, students must graph the data. Teachers can couple this section with a pre-existing graphing unit.
- For example:
  - Chart 1: Where did you grow up, can be charted using a Bar Graph.
  - Chart 2: How did you get your food can be charted using a Pictograph
  - Chart 3: How was your food stored can be charted using a Pie Graph
  - Chart 4: What was your favourite potato recipe can be charted using a Broken Line Graph

Chart 1:

Where did you grow up?	North America	South America	Europe	Asia	Australia	Africa	Antartica
TALLY							
Frequency							
Fraction							
Decimal							
Percentage							

Chart 2:

How did you get your food?	Grow	Gather	Fish	Hunt	Grocery Store	Trade	Other
TALLY							
Frequency							
Fraction							
Decimal							
Percentage							

Chart 3:

How was your food stored?	Refrigerated	Froze it	In a Root Cellar	Salted/ Dried it	Smoked it	Canned it	Other
TALLY							
Frequency							
Fraction							
Decimal							
Percentage							

Chart 4:

What was your favourite potato recipe?	Mashed	Fried	Boiled	Baked	Other	Other	Other
TALLY							
Frequency							
Fraction							
Decimal							
Percentage							

**Evaluation/Assessment:**

- Compilation of interview answers: well-thought out and easily able to input onto chart
- Organization in completing interviews and being ready to tally
- Assess each chart to ensure all peer responses have been added and computed correctly
- Assess the graphs to ensure they have been computed correctly

## Closure/Extension:

- Create Double Bar Graph comparing answers from 2 different generations (yourself, parents, grandparents)

## Lesson #6: What's your Potato Story? continued

**Essential/Driving Question:** How are food stories connected to the cultures of the people around you?

## Subjects Covered:

- Language Arts 6, 7, 8
- Social Studies 6, 7, 8

## Materials/Preparation:

- Food Stories handout (Appendix 4)

**Introduction/Objectives:** Students will increase their awareness of how food helps us to connect to each other, our culture, and our land both past and present. Also, students will connect with how food or potatoes were used in their own family as well as the families of their peers.

- Last class, students were asked to interview and gather stories from their families to gain a greater understanding of the past and present means of producing, accessing, preparing, storing, and consuming food; potatoes.
- In small groups of 2-3 students will share a story about food that was revealed through the interview. What is their personal connection to this story?
- Share a few stories with the class.
- Explain to students that depending on your culture and heritage, you will have very different food stories; this is what makes us unique! Briefly discuss Aboriginal people and their connections to land and food. Read aloud an excerpt from Stó:lô Nation Resource Department regarding their connection to their food and environment:

"Xá:ls, the three sons and daughter of Red Headed Wood Pecker and Black Bear, came into the world to make it right. They traveled through as Stó:lô territory transforming people and things into their permanent state. At each village Xá:ls visited, they transformed people into what are now referred to as resources: salmon; sturgeon; beaver; stones; mountains; trees; etc. These resources were once people and are therefore still considered to be our relatives. The original people's life force, or shxweli, still exists within them. ("Xá:ls: pronounced "kals" but the "k" has the back of the throat glutral sound.)

"Kwikwetlem culture is similar to other Aboriginal people, especially other Stó:lô and Northwest Coast groups, we are a unique people with specific cultural traditions and political interests unlike anyone else's. We take our name from the red fish that historically travelled up the Coquitlam River. Kwikwetlem means "Red Fish up the River". Our elders' stories explain that we have always been here. Archaeology confirms continuous occupation of our traditional territory for at least 9,000 years,

since the last ice age.” (As cited in Kwikwetlem First Nation website, Retrieved on July 30th, 2014)

### Application/Activity:

- Students must answer questions on the Food Stories handout based on the Stó:lô Nation readings. (Appendix 4, Side 1)
- Students must turn the responses they got from their interview questions into a narrative paragraph or story (depending on grade level) about family food traditions.
- Focus on family traditions, customs, and cultural influences and incorporate two older generations into final story. (Appendix 4, Side 2)

### Closure/Extension:

- Students may discuss/describe results of interview in terms of the relationship these people had with their food, food production, and the land and compare to their own answers to these same questions.

## Lesson #7 Planting and Experimenting with your Potatoes

**Essential/Driving Question:** What do all plants need to live and grow?

### Subjects Covered:

- Science 6, 7, 8

### Materials/Preparation:

- Computer, Projector, Document Camera if needed
- Experiment Handout and Answer Key (Appendix 5)

**Introduction/Objectives:** Students will understand the growing needs of plants.

- Ask students: what do humans need to grow well?
- Possible responses: water, food, air, and space
- What do plants need to grow well?
- Possible responses: Water, Food: Soil and nutrients, Air and space, Sun (light)
- Brainstorm and record answers on board.
- Ask students: what would happen to humans if they no longer had air? Ask students to hold their breath. Discuss feelings and responses to having no air.
- Ask students: what would happen if our potato plants got no additional nutrients from the organic food/fertilizer? Record answers on the board.
- Soil Discussion: Water and minerals are taken from the soil through roots. Soil provides support for the plant and an anchor for the roots. Decaying plants leave minerals in the soil (good 4 future plant growth). Soil is important to farmers; without it we cannot grow crops to eat! We need to protect our soils from erosion and degradation for future farming.

- Explain how our Spuds in Tubs kits come with a container of plant food. So, our potato plants will have both soil and additional plant food/fertilizer. The additional plant food will also help our plants get more nutrients above and beyond what the soil provides. Farmers around the world also use additional food for their crops besides from the natural nutrients found in the soil.
- Again ask students: what would happen if our potato plants got no additional nutrients from the organic food/fertilizer? Is this extra food necessary for plant survival?

### Application/Activity:

- Discuss how to conduct Experiments.
- To design an Experiment we need to have three or more trials (5 tubs), a control (4 tubs), a variable that will be changing (no additional plant food for 1 tub), while keeping all other variables consistent (water, sunlight, temperature, location).
- Teacher should help students complete the Experiment handout (Appendix 5). This step can be completed with student input, or with teacher giving more answers, depends on student levels. This can be completed using a document camera or other forms.

### Evaluation/Assessment:

- Collect and Evaluate Experiment Handouts

### Homework/Assignment:

- None at this time

### Closure/Extension:

- Geography/Soil/Ecosystems: Compare potato farming in BC versus PEI, India, Ireland, anywhere (climates, environment, water). Compare fertile lands such as those in BC to lands around the world such as deserts in Africa. Discuss soil erosion, climate change, agriculture, land quality needed to grow potatoes: research issues and ideas about agriculture in BC, specifically potato farming. Soil: study what's in it or during soil hilling, you can discuss the importance of soil to farmers.
- LIGHT: Observe and record growth of potatoes with regard to light and light deprived plants (observe plant's reaction to access to sunlight and how they move to get more). Leave one tub inside and use artificial growing lights and compare to tubs placed outside under natural sunlight.
- Experimentation: plant one tub after spring break and compare how it grows versus the ones planted earlier. Informal experiment: talk to your plant, versus no talking. Analyze how different organisms adapt to their environment; try to vary the light and water access to the plants i.e. keep some indoors, different locations, different watering amounts.
- Growing cycle: Study the lifecycle of a potato and compare with other lifecycles in the plant kingdom. Scientific process of growing; importance of sunlight, water, soil. Needs of living things, how things grow, what plants need to grow, parts of a plant.
- Keep a journal of scientific observations; weekly check in where students observe, record data, measure, water, predict.
- Water Unit: Change: the changes in plants, weather, amount of watering etc. Each child brings a water bottle and keeps it for watering.

## IMPORTANT NOTE:

- After LESSON #7 is complete, please see Stages 1 – Stages 3 in the Spuds in Tubs Handbook for instructions on planting, watering, and hilling your spuds.
- You will also find additional information as to when you can move your tubs outside etc.
- Please see Appendix 6 for cross-curricular lesson ideas to complete for the duration of Spuds in Tubs growing cycle.
- COMPLETE LESSON #8 and LESSON #9 BEFORE MOVING YOUR POTATOES OUTSIDE:

## Lesson 8: Potato Moving Proposal

**Essential/Driving Question:** How do we overcome the obstacles faced when growing crops outdoors?

### Subjects Covered:

- Physical and Health Education 6, 7, 8
- Visual Arts 6, 7, 8
- Social Studies 6, 7, 8

### Materials/Preparation:

- Map of your school including grounds/fields
- Collaboration/Teamwork Rubric (Appendix 3)

**Introduction/Objectives:** Students will identify obstacles and propose methods to overcome them.

- Review on board what do all plants need to grow properly? (soil (food), water, air, sun, space)
- Ask students to PREDICT: what will happen to our tubs when moved outside? What will happen to our potatoes if we don't move them? Think about possible vandalism and predators.
- This is similar to obstacles that farmers face all of the time. Review with students Pete's Potato Angels story and the obstacles Pete and his family faced. Brainstorm other obstacles farmers around the world may face...
- We need to work together to overcome these types of obstacles...

### Application/Activity:

- Students will work in their groups to prepare a proposal explaining where their potatoes should be moved, why they chose that location, who will move them, and how they will be moved.
- Criteria: safe area, south facing wall, near water source, in sunlight, approved by Administrator or grounds keeper...
- Students must use a school map to show their selected location
- Teacher should review elements of a good proposal, persuasive language to use etc.
- Each group member must complete a Collaboration/Teamwork Rubric on their role in the proposal development, collaboration, presentation etc. (Appendix 3)

### Evaluation/Assessment:

- Assess student collaboration and on-task behavior while planning, assess Collaboration/Teamwork Rubric (Appendix 3)
- Evaluate proposal for inclusion of criteria, organization, grammar

### Homework/Assignment:

- Final Draft of the Group's Proposal due next class

### Closure/Extension:

- These proposals can be presented to the class, administrator, or custodian. (Follow up Lesson)
- Students may wish to present their proposals using different mediums; Power Point, Prezi, iMovie, Poster, Storyboard, Book Report, Pamphlet
- Write thank-you letters to various groups/people involved in watching the proposal presentations following correct letter writing format

## Lesson 9: Agricultural Art

**Essential/Driving Question:** How can we use our harvest to create art?

### Subjects Covered:

- Visual Arts 6, 7, 8

### Materials/Preparation:

- Paint
- Foil trays, pie pans, or bowls
- 3-5 green leaves per student off of your potato plants
- White paper
- Coloured construction paper
- Glue

**Introduction/Objectives:** Students will create art using materials from their potato harvest.

- Students will go outside and check on their potato plants.
- Each student must carefully pick 3-5 leaves off of their plants.
- Ask them to pick leaves that have a lot of texture/lines on the bottom.
- Take leaves back inside.

### Application/Activity:

- Explain that they will be making art that can be referred to as 'environmental' or 'recycled' art. This is because they are using pre-existing or old materials (leaves) to create new art (Leaf picture).
- Explain that they will be making a picture using "leaf printing' or 'leaf stamping' techniques.

### Steps:

- Teacher must pour different coloured paints into foil trays, pie pans, or bowls (wide enough to fit a leaf inside). Groups can share each of these trays.
- Teacher must demonstrate how to stamp/print the leaf
- dip one leaf at a time into the pan (bottom side onto the paint)
- gently stamp that leaf onto your white paper, and remove it
- you should see the pattern of your leaf painted onto your sheet
- too much paint will leave a glob of paint with no lines showing
- use the same colour as many times as you'd like
- each leaf can be spread around the page or layered on top of the previous colour
- once dry, students can glue their white paper onto a coloured piece of construction paper

### Evaluation/Assessment:

- Collect final art project and evaluate for its presentation, organization, neatness, creativity etc.

### Homework/Assignment:

- Students who were unable to complete can do so after school and hand in next class.

### Closure/Extension:

- Students may glue some of their green leaves right onto the pictures for a more natural affect
- Students may paint designs onto cardboard boxes, and then fill these boxes with their potato harvest and take them home as gifts for their families or for Father's Day
- Using button eyes, and other facial parts from craft stores, students may create their own Mr. Potato Head
- Students may brainstorm and create their own art project that could be made with their potato plants using the leaves, peelings etc.

### Important Note:

After LESSON 9 is complete, please see Stages 4 – Stages 6 in the Spuds in Tubs Handbook for instructions on moving your tubs outside and taking care of your tubs while they are outside.

COMPLETE LESSON #10 RIGHT BEFORE THE HARVEST:

## Lesson 10: Potato Meals

**Essential/Driving Question:** What are some benefits of eating locally grown food?

### Subjects Covered:

- Language Arts 6, 7, 8
- Social Studies 6, 7, 8
- Mathematics 6, 7, 8
- Physical and Health Education 6, 7, 8

### Materials/Preparation:

- Computer and projector, internet access
- Small poster paper, markers, pencils, pencil crayons
- Eat Local, Meal Plan, Recipe handouts (Appendix 7)
- Recipe Samples: Teacher should show examples of recipes, as well as scaffold language and organizational patterns of recipes before teaching this lesson.

**Introduction/Objectives:** Students will create a menu using potatoes, and understand benefits of using locally grown foods as ingredients in their meals.

- On board, brainstorm with students definitions of the 3 terms; 100 Mile Diet, Eat Local, Zero Mile Diet
- Explain that growing their own potatoes would be considered being a part of the Zero Mile Diet
- Share story of Alisa Smith and James MacKinnon, and families from Mission who experimented for one year of eating food grown within 100 miles of their home
- YouTube Video: <http://www.youtube.com/watch?v=TZEaB2sd28M> (6mins 32seconds)
- Wikipedia write up: [http://en.wikipedia.org/wiki/The\\_100-Mile\\_Diet](http://en.wikipedia.org/wiki/The_100-Mile_Diet)

### Application/Activity:

- Ask: Why don't we all stick to eating locally grown food? Why do we purchase food from abroad/ other countries, especially when we can obtain that same food item in BC (i.e. apples, potatoes)? Have groups brainstorm suggested answers to these questions. (share with class)
- Show YouTube clip of "Do You Know Where Your Food Comes From? Eat Real. Eat Local" <http://www.youtube.com/watch?v=dlsEG2SFOvM>
- Students will each complete Eat Local, Meal Plan, Recipe handouts (Appendix 4)
- Side 1: Research and record reasons for buying and eating locally. Use following sites:
  - <http://localfoods.about.com/od/finduselocalfoods/tp/5-Reasons-to-Eat-Local-Foods.htm>
  - [http://msue.anr.msu.edu/news/7\\_benefits\\_of\\_eating\\_local\\_foods](http://msue.anr.msu.edu/news/7_benefits_of_eating_local_foods)
- Side 2: Students will design a one-day meal plan (breakfast, lunch, dinner, dessert) that uses Potatoes as the main ingredient.

- Side 3: Students will choose one meal, and develop a recipe for that meal using all local ingredients. Must list correct measurements needed of each ingredient, use sequencing language when writing out instructions for how to prepare the meal (first, then, next etc.).

### Evaluation/Assessment:

- Collect final menu project and assess student list of reasons for buying and eating locally.
- Evaluate menu for its thoroughness, presentation, appetizing factor, inclusion of potato ingredient in each meal.
- Evaluate Recipe for organization, correct ingredient measurements, correct sequencing of steps etc.

### Homework/Assignment:

- Create your own due date for the completion of the handouts

### Closure/Extension:

- In groups, create/present a skit that demonstrates the health benefits of eating BC grown food.
- Make a video of themselves making one of their meals and commenting on benefits of eating locally grown food. (Students can pretend they are on the Food Network.)
- Have a whole class U-Debate: buy local versus imports
- Science: As the plants start wilting and turning yellow, share with students that the nutrients are now going to the potatoes versus the leaves and stems.

### IMPORTANT NOTE:

Please see Stages 7 – Stages 8 in the Spuds in Tubs Handbook for instructions on harvesting and cooking your potato harvest.

COMPLETE LESSON #11 - #12 AFTER THE HARVEST:

## Lesson 11/12: Potato Meals continued

**Essential/Driving Question:** How can we enjoy our harvest?

### Subjects Covered:

- Physical and Health Education 6, 7, 8
- Home Economics and Foods 6, 7, 8

### Materials/Preparation:

- Potatoes from your harvest
- Ingredients needed for the final meals
- School kitchen with necessary tools

### Lesson 11:

- From the recipes created by students last class, choose the 5 most healthy and economically possible to cook with students on your budget
- Ask the students to vote for their favourite meal
- The 3 meals that get the most votes will be the ones you will create next class
- Based on the 3 chosen, have groups choose which meal they will make
- Each student from the group will volunteer to bring in necessary ingredients
- Funding for ingredients: you may obtain funding from your school PAC, Administrator, Home Economics budget, Grade level funds, or even have a fundraiser with your class
- Homework/Assignment: Bring in the ingredients required for your potato meals

### Lesson 12:

- Teacher may want to collaborate with the Home Economics teacher for this lesson
- Reserve use of the school kitchen in advance of this day
- Before entering kitchen, go over safety rules and proper hand washing techniques etc.
- Each group will prepare their chosen potato meal
- When finished students will share their meals with the entire class, like a potluck!

### Evaluation/Assessment:

- Observe and evaluate student participation and collaboration while they create and make their meals (Social Responsibility, Safety)

### Closure/Extension:

- Meal ideas: Cook in a pressure cooker, boil in a large pot, cut and deep fry, make "potato sundaes" with each group bringing something for a topping: sour cream, cheese, green onions, bacon bits, butter, salt, pepper.
- Harvest: bring in parents and grandparents to help with the harvest. Donate the potatoes to the local Food Bank or take home and share with families. Upon harvest, conduct a taste test of their local, Zero Mile Diet' potatoes versus imported potatoes.
- Environment: Students can separate and then compost roots, seed potatoes, and peelings.
- Culture: Students can compare this classroom potato feast with their own family food celebrations and share in a written or oral form.
- Math: Adding: Count during harvest; line up and then count in fives, tens, count leaves as they grow, weekly counts. Division: Divide up the harvest per student. Comparing: compare the size/weight of smallest to largest potato.



## APPENDIX 1 – Booklet

Picture-Perfect Potatoes

Name: \_\_\_\_\_

[A] – Brainstorm



[B] - Potato Classifying Chart (record in centimeters-cm and pounds-lbs.)

Potato	Length	Width	Weight	Colour	Texture
#1					
#2					
#3					
#4					
#5					
Average of each row					

[C] - Questions: Answer in complete sentences:

#1. Out of the 5 potatoes you observed, which one do you eat the most?

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#2. Estimate what is the average cost of potatoes per pound? (lbs) (Check your answers)

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#3. How many times per week do you eat food that has potatoes in it?

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#4. What is your favourite food to eat that uses potatoes in the recipe?

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#5. Explain some benefits of eating potatoes?

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#6. Where do you think potatoes are grown?

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#7. How are potatoes grown by farmers? (i.e. on trees, underground, in greenhouses)

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#8. Find 5 students who eat potatoes in your class and record how they eat the potatoes.  
(i.e. fried, baked, boiled?)

Student Name	How Potatoes are Eaten by him or her
#1	
#2	
#3	
#4	
#5	

9. Make a sketch of your favourite food/meal that includes potatoes:

10. Sketch what a potato plant looks like. Label the following things:  
(where the stems are, where the potatoes grow, where the seeds are)

11. Draw 3 things that potato plants need to grow properly:

1.

2.

3.

## APPENDIX 2 – Reading Strategy

Picture-Perfect Potatoes - Reading Strategy

Name: \_\_\_\_\_

**Instructions:** Complete each box as you read the story. Give as many details as you can.

<p><b>Box 1 - Enquiry</b></p> <p>Ask 3 questions to either the author of this story or to characters in this story.</p> <p>Question #1</p>   <p>Question#2</p>   <p>Question #3</p>	<p><b>Box 2 - Vocabulary</b></p> <p>As you read, write down words that you find interesting or words that you have never heard before</p>
<p><b>Box 3 - Art</b></p> <p>Make a quick sketch of what you envisioned while reading the story.</p>	<p><b>Box 4 - Connecting</b></p> <p>Explain why Pete thinks of the Snow Geese as Angels.</p>

## APPENDIX 3 – Collaboration/Teamwork Rubric

Collaboration/Teamwork Rubric

Student Name: \_\_\_\_\_

	Not Yet Meeting Expectations	Minimally Meeting Expectations	Meeting Expectations	Exceeding Expectations
<b>Responsibility</b>	<ul style="list-style-type: none"> <li>• not prepared and ready to work</li> <li>• does not complete project tasks</li> <li>• does not complete project tasks on time</li> <li>• does not use feedback from others to improve work</li> </ul>	<ul style="list-style-type: none"> <li>• sometimes prepared and ready to work</li> <li>• completes some project tasks, but needs to be reminded</li> <li>• completes some tasks on time</li> <li>• sometimes uses feedback from others</li> </ul>	<ul style="list-style-type: none"> <li>• is prepared and ready to work with the team; is available for meetings and communicates well</li> <li>• does what s/he is supposed to do without reminders</li> <li>• completes tasks on time</li> <li>• uses feedback from others</li> </ul>	<p><i>In addition to Meeting Expectations:</i></p> <ul style="list-style-type: none"> <li>• does more than what s/he has to do</li> <li>• asks for additional feedback to improve his or her work, beyond what everyone has been given</li> </ul>
<b>Helping</b>	<ul style="list-style-type: none"> <li>• does not help the team solve problems; may cause problems</li> <li>• does not share ideas with the group</li> <li>• does not give useful feedback to group</li> <li>• does not offer to help others</li> </ul>	<ul style="list-style-type: none"> <li>• sometimes cooperates with the group but does not help</li> <li>• shares some ideas with the group</li> <li>• sometimes gives useful feedback</li> <li>• sometimes offers to help</li> </ul>	<ul style="list-style-type: none"> <li>• helps group solve problems, manage conflict, and stay focused and organized</li> <li>• shares ideas that help the group improve</li> <li>• gives good feedback</li> <li>• offers to help the group when they need it</li> </ul>	<p><i>In addition to Meeting Expectations:</i></p> <ul style="list-style-type: none"> <li>• helps the group when someone is absent</li> <li>• encourages group to share ideas, connect with the project</li> <li>• helps group members who don't understand or are falling behind</li> </ul>
<b>Respect</b>	<ul style="list-style-type: none"> <li>• does not pay attention during group discussions</li> <li>• does not show respect to group members (interrupts, ignores, hurts feelings)</li> </ul>	<ul style="list-style-type: none"> <li>• sometimes listens to group ideas</li> <li>• is sometimes polite, kind, and respectful</li> </ul>	<ul style="list-style-type: none"> <li>• listens carefully to all group members</li> <li>• is always polite, kind, and respectful</li> </ul>	<p><i>In addition to Meeting Expectations:</i></p> <ul style="list-style-type: none"> <li>• encourages the group to listen to each other and be respectful</li> <li>• encourages everyone and helps the group respect everyone's ideas</li> </ul>

Group Members:

Teacher Comments:

## APPENDIX 4 – Food Stories handout

Food Stories Handout

Name: \_\_\_\_\_

### [A] – Questions about the Stó:lô Nation readings:

#1 - Who are the Stó:lô people? \_\_\_\_\_

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#2 - When do you think this story was created? \_\_\_\_\_

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#3 - How might these people view their environment? \_\_\_\_\_

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#4 - What are their connections to nature? \_\_\_\_\_

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#5 - What can be implied about their relationship with food? \_\_\_\_\_

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#6 - Express meaning behind Stó:lô Nation quote; how it might relate to past/present traditions, and relationships with food?

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## APPENDIX 5 – EXPERIMENT HANDOUT

Spuds in Tubs Experiment

Name: \_\_\_\_\_

Question:

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Hypothesis:

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Materials:

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Method:

1. 

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2. 

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3. 

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4. 

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5. 

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6. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

9. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

10. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

11. \_\_\_\_\_  
\_\_\_\_\_  
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12. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

13. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

15. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Observations: Measure in centimeters (cm)

Day	Stem Length of test Tub	Stem Length of other Tub	Stem Width of test Tub	Stem Width of other Tub	Stem Colour of test Tub	Stem Colour of other Tub	Leaf Shape of test Tub	Leaf Shape of other Tub
1								

Diagrams/Observations:







## Experiment Handout Answer Key:

### Question

- Will the average mass of one tub of potatoes change when that tub does not get fed extra nutrients in the form of plant food?

### Hypothesis

- Students must complete this section on their own. (insert percentage)
- **Sample Hypothesis:** *The mass of potatoes in the tub that does not get fed additional nutrients via plant food will be 50% less than the tubs that do receive additional plant food.*

### Materials

- 5 tubs
- 1 container of plant food/fertilizer with measuring scoop
- 13 bags of soil
- 25 seed potatoes
- 1 plastic Drop Sheet
- 5 rulers
- Sign on Tub with no extra food
- Water

### Method

- Follow Stage 1 and Stage 2 in Spuds in Tubs Guide Book
- Choose and Label one tub that will never get additional plant food (on the day of planting as well as on the day you move your tubs outside).
- On the day of the harvest, for accurate measurements, students must harvest each tub separately.
- They must wash all soil off the potatoes completely and dry the potatoes.
- Then they must weigh the harvest from each tub separately and find an average from the four tubs that received plant food.
- Repeat these steps for the tub that didn't receive extra food. Now conclude listing difference in percent.

### Data/Observations (including graphs, charts)

- Ongoing throughout the growing cycle.
- Observe the stem lengths and widths, and colours and shapes of the plants.
- This could be charted or written out in an observation journal. (see chart on Experiment handout; Appendix 5)

## Conclusions

- Students must answer Yes or No to the question asked above; will the average mass of one tub of potatoes change when that tub does not get fed extra nutrients in the form of plant food based on results.

## Sources of Error

- Work with students to identify any possible sources of error; i.e. outside sources adding things to the tubs on weekends (animals and insects landing in tubs, people throwing litter) etc.

## Other Questions

- Work with students to brainstorm any additional questions that have come out of this experiment.

## APPENDIX 6

**More Lesson Ideas:** Use the following lesson ideas **AFTER** planting your Spuds in Tubs, and throughout the growing process.

Enhancement Lesson Ideas for the duration of your growing cycle:

### [A] Language Arts Lessons:

- **Reading:** include a variety of texts throughout the unit such as...
  - Seedfolks by Paul Fleischman (Grade Level Equivalent 4.9)
  - Black Potatoes: The Story of the Great Irish Famine, 1845-1850 by Susan Campbell Bartoletti (Grade Level Equivalent 7.9)
  - America the Beautiful; Idaho (Revised Edition) by Deborah Kent (Grade Level Equivalent 8)
  - Nory Ryan's Song by Patricia Reilly Giff (Grade Level Equivalent 4.9)
- **Writing:** complete a variety of writing activities throughout the unit including...
  - Thank-you letters to various groups/people involved in this program (letter format)
  - Stories about Life of a Potato (narrative writing)
  - News Articles about the project for the school newsletter (explanatory writing)
  - Journal about how it feels to be a farmer (perspective taking)
  - Project Diary encouraging students to address the language used throughout the project as well as the content and skills used. Highlight what students have been able to accomplish, and what they were unable to complete as planned.

- **Oral Language:** develop oral language skills by...
  - Interview a local farmer during an afterschool visit, fieldtrip, or in-class visit and communicate their findings to the class
  - Conduct Student Led Conference during Parent Teacher interviews and explain what's happening to the potatoes; the planting, growth process etc.
  - Give presentations about the experience to other classes in the school
- **Social Media:** record their growing process using a variety of social media such as...
  - Tweet about it through a class Twitter account
  - Create a Facebook Page and update weekly
  - Blog about it (for example: <http://blogs.sd41.bc.ca/shusterl/2014/06/13/>)

### [B] - Social Studies Lessons:

- Creativity: use the ideas generated to invent a solution for world hunger including easy growing techniques such as the Spuds in Tubs Program
- Research: complete a research project about the Irish Potato Famine
- Community Connections: On day of planting discuss how the warba seed potatoes are grown in Richmond, BC. You can enhance conversation by discussing the Fraser River and its role in BC's agriculture. Also, include ideas about Climate Change.

### [C] – Physical and Health Education Lessons:

- Social responsibility: caring and respect for living things, sharing with others. Learning where food comes from, their role in the food system. Caring for our environment.
- Community Outreach: Connect with high school students enrolled in Sustainable Agriculture 11/12 courses, College or University students enrolled in Environmental and Health Literacy Courses, or local Nurses or Dieticians and have them lead lessons/discussions about local foods, advantages of eating local, climate change, agriculture land etc. Students could also interview these people.

### [D] - Visual Arts Lessons:

- Sketching: students could observe and record the growth of their plants and report the changes using pictures. Also, they may use drawings, paintings, photos to document the growth and changes of the plants.
- Label: the parts of a potato plant included what's under the dirt.

### [E] - Mathematics Lessons:

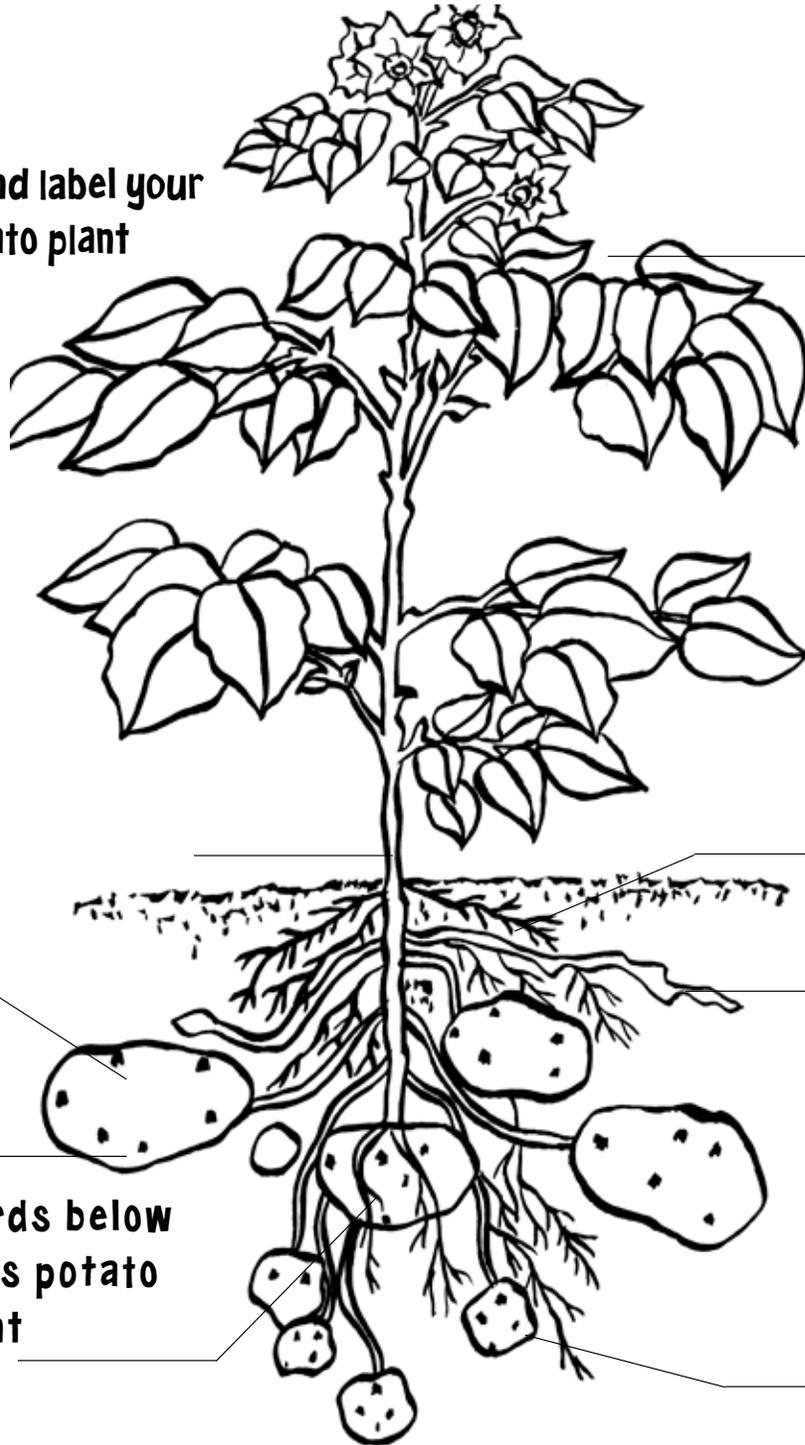
- Recording data the growth of their plants into their Project Diaries; stem lengths, amount of water used. Report the changes using graphs, and charts.
- Measurement: of sprout and plant, conversions mm to cm to m as plant stems grow, conversion from ml to l while watering (gives real life perspectives of the units and how they work together) Keep a measurement data chart/tables: measure sprouts and choose what unit to use (mm versus cm) \*measure sunlight amount, weather, Volume of water, soil used...

- Estimating: predict in Project Diary how many potatoes they think will appear in the harvest
- Weighing: weigh the spud potatoes upon planting, and total weight of potatoes come out of each tub. Can also weigh one spud potato and then estimate the gross weight of all spuds. Compare this total to the total upon harvest.

# Spuds in Tubs

Name: \_\_\_\_\_

Colour and label your potato plant



Use the words below to label this potato plant

Flower

Rhizomes

Eye

Stem

Eye

Roots

Name: \_\_\_\_\_

## Spuds in Tubs Wordsearch

potato      vegetable      agriculture      edible      planting  
compost      spuds      harvest      crop      soil  
sprouting      growing      tuber      eyes      warba

e	l	b	a	t	e	g	e	v	q	w	e	r	o	y
e	u	i	g	o	p	o	a	s	d	f	g	h	r	j
k	r	l	n	z	t	e	g	g	u	n	c	x	g	c
v	b	u	i	a	n	m	q	w	w	a	r	b	a	e
o	t	a	t	o	p	r	t	m	y	u	o	i	n	o
g	s	o	n	l	p	a	e	s	d	f	p	g	i	h
n	p	j	a	n	u	t	r	i	e	n	t	s	c	k
i	r	l	l	z	s	c	g	m	e	t	s	x	c	v
l	o	b	p	i	o	n	i	n	m	q	o	w	e	r
l	u	d	f	g	o	s	h	r	i	j	p	k	l	z
i	t	x	c	v	s	s	b	n	g	w	m	m	q	t
h	i	w	e	p	r	t	y	s	u	a	o	i	o	u
p	n	a	u	h	a	r	v	e	s	t	c	r	s	b
d	g	d	f	g	h	j	l	y	z	x	c	v	g	e

# Spuds in Tubs

## APPENDIX 7 – Eat Local and Menu Handout

### My TOP 5 Reasons For Buying and Eating Local Food

Reason #1

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Reason #2

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Reason #3

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Reason #4

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Reason #5

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## My Local Potato Meal Plan

### BREAKFAST

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

### LUNCH

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

### DINNER

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

### DESSERT

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

# My Local Potato Recipe

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## Ingredients Needed:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

## How to Prepare:

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_

