**Lesson Plan Sequence**

**Lesson 1:**

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| **Subject:** Social Studies 11  **Unit:** Sustainability and Human Geography Mini Unit  **Lesson Number:** 1 of 3  **Lesson Title:** Sustainability in Action  **Time:**75 Minutes |
| **Prescribed Learning Outcomes:**   1. Human Geography: Population Distribution, Density, Freshwater Quality and Supply, Global Warming, Canada’s Standard of Living in Comparison to other countries. 2. Skills and Processes of Social Studies: Assessing Information, Ethical Behaviour, Open Mindedness, Collaboration. 3. Other: Critical thought and evaluation of topics related to current societal stances on food and water management and resource allocation. |
| **Students Will Be Able To (SWBAT):**   1. Identify how population fluctuates according to resources and mobility. 2. Acknowledge differences between Hunter-Gatherer societies and Agricultural societies and identify the pros and cons of each. 3. Accurately portray migration of hunter-gatherer/agricultural groups and explain the challenges of migration. 4. Demonstrate the dangers of unsustainable practices through the mechanisms of the game itself. |
| **Specific Language Objectives:**   1. Introduce students to the lexicon associated with global warming in an interactive, engaging and entertaining way. 2. Challenge them to practice those terms by participating in the game |
| **Materials Required:**   * 900 or so popsicle sticks. * Six dice. * Three small flags or region name sheets. * A pre-printed handout of game rules and definitions or a version for overhead/data projectors. * A series of pre-prepared “random events” to occur within the activity (game script, related to the gain, loss, or transfer of resources). * Labels to mark three table groupings of the room as different ‘regions.’ * Popsicle sticks with students’ names printed and taped on. Students must earn their popsicle sticks by participating in class discussion throughout the unit to receive marks. |
| **Assessment:**  For the duration of this unit the only assessment taking place will be through class participation popsicle sticks. Students will earn these for contributing to and adding to the class participation. |

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| **Time Frame** | **I will be doing:** | **Students will be doing:** |
| Brief Introduction (10 minuets) | Introducing the game “Tragedy of the Commons” and explaining the rules before launching into a tutorial round. | Listening |
| Tutorial Round (10 minutes) | Introducing the students further to how the game operates. | Playing along with my instructions. |
| Game Proper (50 minutes) | Solving disputes, announcing random events as per the needs of the game. Teacher has total control of the length of the game using these “random events,” so be sure to time accordingly. | Playing amongst themselves according to the rules of the game. |
| Conclusion (10 minutes) | Debriefing discussion about sustainability. Have students offer definitions of the important terms involved with the game. Emphasize population growth and sustainable resource development  Inform the students that sustainability and population growth will be the topics of the upcoming lessons. | Participating in the class discussion for participation marks. |

**Resources:**

**Tragedy of the Commons – The Rules:**

The idea of this game is to collect all the popsicle sticks owned by your rivals, both in your region and beyond. There are three regions: Toneria, Stephistan and Randiland, all with an equal number of popsicle sticks.

The game is played in turns. Each turn has a maximum of four phases.

*Harvest Phase:*

First is the Harvest Phase, in which every player collects a certain number of resources, starting from 1. Every nation in the region will roll a dice to see how good the harvest is. If they roll a 1, it’s a poor harvest, they can only take one stick from the middle. If they roll a six, it’s an excellent harvest, and they can take six from the middle, and so on. Players will go around in a circle clockwise. This phase ends when everyone has rolled.

*Action Phase:*

Next is the action phase. In the action phase you have two choices: attack or move. You must have a minimum of two sticks to attack, and so must the player you are playing, but you can move at any time. The most resource rich player gets the first choice of move or attack.

**Attacking:**

If you attack, you must decide a wager to attack for that both players can pay. If two players have 6 sticks, they can battle for 5, because war costs resources. Give the wasted sticks to the Regionmaster. You must announce the wager before you attack, because the defender has a choice, too. Ie. I’m going to attack Adel for 3 sticks.

**Defending:**

Let’s say Adel refuses to fight, and instead decides to run away. He can do this whenever he wants, like if the wager is too high, or if he wanted to move and didn’t really want to attack anyway. When he leaves the region he chooses a new region to join, but cannot attack or move again that turn. He does not have to waste a resource.

**Moving:**

A player can switch regions any time they want during this phase, but it means it is the end of the turn, so if they wish to attack within their region, they must do that first. If a player loses a fight, whether they started it or not, the phase is done for them as well, and they cannot move. Other people may still attack them, though no one can attack the same person twice in one phase. Only a player who wins can then decide to either attack someone else, or move and end their turn.

*Population Growth Phase:*

Next, there is the Population Growth phase. Everyone gives one stick to the Regionmaster as a discard. The Regionmaster looks at the amount of sticks left in the middle, and at the amount held by each player, then decides a natural event to happen from a list I will provide. This list of events will have different effects. Some events will give each player a stick from the middle, or two. Some events will cause every player to lose sticks. When these sticks are lost to the game and not to another player, they are given to the Regionmaster as discards. These represent unsustainable resources. New resources can be discovered, to make the game go longer (your script will have events for that, too). But when we decide the game has gone on long enough, we will stop adding resources. The Earth runs out. Players can move regions to stave off the inevitable, but eventually all the sticks will be gone and in the hands of the players. The random events will then quickly discard most of the sticks, leaving everyone with pitifully few resources.

At this point, everyone will still be in the game, but the eliminations will come fast. Players will starve to death since they can no longer harvest from the region, and their own population growth will eventually consume them. They will join a faction of their choice as refugees, and follow that player until only two teams remain, with one stick each unable to afford a fight. The game stops, a stalemate. The Earth is a wasteland, and we see where unsustainable practices have gotten us at last. We can be certain the game will last about 45 minutes, possibly even an hour.

*Region Master Events for the Nature Phase*

***Positive (Players take sticks from middle):***

Examples:

A new bank of codfish has been discovered off the coast of your region! Exploit! Each player in the region rolls two dice during the next Harvest Phase.

Crop rotation has been discovered. By planting different types of plants on different fields in a rotation you can produce different nutrients and prevent soil exhaustion! Push back the forest! Exploit! Each player adds two to their next Harvest Phase Roll

Your region has legalized fracking! Get every last drop of that oil and gas! Each player adds one to their next Harvest Phase Roll.

Other Examples:

Cheap and easy-to-produce hormone injections have made it possible to genetically engineer more meat for less money. We could all use a little more methane.

Hydroponics may be energy intensive, but now we don’t even need dirt to grow plants!

A new entrepreneurial class of dump diggers has emerged, digging up what other generations threw away and what new generations can still use!

A new oil sands has been discovered!

A new underwater oil field has been discovered! Move in the rigs!

New coal deposits discovered!

You are now allowed to dump toxic waste anywhere you want! Big savings!

WHATEVER OTHER RESOURCE EXTRACTION YOU CAN THINK OF!

***Negative Events: (Involve Discarding Sticks from the Game)***

Examples:

The Cod fish has gone extinct! Population growth discard multiplied x2.

Global warming has caused a swell in the world’s sea levels, destroying a number of prominent coastal cities! Population growth discard multiplied x5.

Whatever other disaster the region/worldmaster can think up!

***Balancing Events: (Involve shaking up the game, taking sticks from the strong and giving them to the weak, or sustainable inventions that cause more sticks to be injected into a given region)***

Examples:

The hydrogen fuel cell has been perfected, making cars non-toxic and running on water and batteries. This frees up much more oil and gas for much more practical uses, such as synthetics. Doesn’t your heart just burn for all the muscle car enthusiasts and hummer drivers, though?

Taking the advice laid out in the book Stay Solid, your region’s citizens have made their own toilets at home, saving valuable water! Population growth discard lessened by 1!

A community garden initiative has just started up. Everyone’s saving money and energy on moving food around. Add a handful of sticks to the center of region x!

Garbage facilities throughout your region are now sortable, and recycling and composting are done on a massive scale! No population growth discard for the next two turns!

A huge dead zone is developing off your coast. Wonder why? You have to beg the other regions for help! Move a handful of resources to another region.

*Ending the Game:*

\*\*When we are near the end, or the teacher decides the game has gone long enough, regions will start failing. Regions will run out at different speeds. When the first runs out there is no sense in staying. Players will move to other regions still containing resources.

A region that has no more resources and no people sitting there becomes a wasteland. The oceans are one big deadzone, the land is desert and tundra, and no forests or rivers remain flowing. Temperatures soar, and the last desperate inhabitants leave or die off. [Region x] is off-limits forever.

This means players will eventually be unable to run away from fights and have only one stick remaining. When that is the case, if they are challenged and lose, they are conquered, which is the same as a refugee. The game ends when all the resources are gone, and the game master only introduces negative events. With all the class at one table, the time is perfect to debrief what just happened as a group in a close-knit discussion.

**Lesson 2:**

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| **Subject:** Social Studies 11  **Unit:** Sustainability and Human Geography Mini Unit  **Lesson Number:** 2 of 3  **Lesson Title:** The Big Problem: Unsustainable Population Growth  **Time:**80 Minutes |
| **Prescribed Learning Outcomes:**   1. Relate changes in Canada’s population to changes in world population. 2. Describe possible responses to population growth, such as improving literacy rates, economic development plans for women and family planning. 3. Recognize connections between events and their causes, consequences, and implications. |
| **Students Will Be Able To (SWBAT):**   1. Explain what international policies have led to increased population growth. 2. Explain the factors involved in Canada’s population growth. 3. Connect policies that originate in the developed world with their impacts in the developing world. |
| **Specific Language Objectives:**   1. Introduce key terms of lexicon related to population policies, such as the One Child policy. 2. Refine understanding of comparative language, such as “conversely”, “on the other hand” and others. 3. Facilitate understanding of terms by having students create their own definitions to terms found. |
| **Materials Required:**   * Lists of recent population policies for Canada and selected other nations * Classroom with overhead projector or PowerPoint display system * Population Pyramids for Canada and each of the selected nations, to be placed around the room * Tape and other stationery supplies * Chart paper * Felt pens * Whiteboard and markers * Data projector and/or students’ technological devices * Popsicle sticks with students’ names printed and taped on. Students must earn their popsicle sticks by participating in class discussion throughout the unit to receive marks. * <http://www.gapminder.org/world/> * <http://www.google.com/analytics/> * [www.worldometers.info](http://www.worldometers.info)   **Lesson Body Printouts found here to be copied and collated before lesson[[1]](#footnote-1):**   * <http://www.indexmundi.com/graphs/population-pyramids/canada-population-pyramid-2012.gif> Canada * <http://upload.wikimedia.org/wikipedia/en/b/b8/China_Pop_Pyramid_2012.png> China * <http://tfw.cachefly.net/snm/images/nm/pyramids/in-2003.pn>g India * <http://leftoutside.files.wordpress.com/2010/05/us-population-pyramid.jpg> America   **Population control policies:**   * <http://www.cprn.org/documents/46413_fr.pdf> Canada * <http://www.colby.edu/personal/t/thtieten/Famplan.htm> India <http://en.wikipedia.org/wiki/One-child_policy> China <http://yaleglobal.yale.edu/content/us-immigration-policy-likely-boost-population> America   **World population, 1900**:   * <http://www.worldmapper.org/posters/worldmapper_map9_ver5.pdf> |
| **Adaptations, Modifications, Extension Notes:**   1. In the event of language or learning deficits the lesson may be shortened or abridged to only involve the Canada-relevant sections of the lesson. 2. If a projector and computer are unavailable, have the class pass around print-screens of the enclosed links. 3. For students that finish early, elaborate on the closing activity: get students to use personal devices to answer the question of whether or not human global population is rising at an unsustainable rate, or if it is slowing down, using google stats or the gapminder application. |

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| **Time Frame** | **I will be doing:** | **Students will be doing:** |
| Introduction (5 minutes) | Showing the students the world population count outpacing the world death count on worldometers.info.  Summarize the dire warning this illustrates by referring back to the game played in Lesson 1. | Listening, watching. |
| Part 1: 25 minutes. | Numbering students into groups.  Assigning a nation to each group once they are settled and in their table or desk grouping.  Assisting troubled groups by providing them with handouts printed from the materials section. | Forming groups equal to the number of nations being profiled in the class (groups of 6-8 for 3-5 nations).  Using personal devices (those without may share) to search for population control policies enacted by that nation over the past hundred years. The stronger English students can assist the weaker ones with terminology. |
| Part 2: 10 Minutes | Commenting on sharing of reports, placing national population pyramids around room. | Groups will report out to the class and explain what they have learned about the nation they were asked to study. |
| Part 3: 20 Minutes | While each group is moving to the population pyramids, provide the groups with a piece of chart paper and felt pens. | One student from each group will go to each of the population pyramids and determine how the population of the nation changed over the 20th century, and use that information to determine how effective each nation’s policies were. |
| Part 4: 15 Minutes | Supplementing student-provided information. | Once that information is obtained, complete a placemat activity with each person in the group presenting information to their group members, and one member of the group writing down the similarities in policies for each nation, if there were any. |
| Conclusion: 5 Minutes | Have students think about whether there is enough food and other resources for the people who are already on the planet now, and write down what kind of policy they would have Canada follow in order to ensure we have a stable population in the future.  Ensure that students are aware of the required reading and other information for the next day’s lesson. |  |
| **Follow-up:**  Work on preparing the information needed for the next two day’s classes, including preparation for the game in lesson 3 of the unit. | | |
| **Reflection:**  Think about what possibly could be done to ensure that transitions are done in a timely manner and that they do not take up too much time in the lesson.  Consider the effectiveness of the activities that were chosen in order to ensure an understanding of the objectives, and consider what other activities may have been more effective.  Given that this lesson assumes no prior knowledge with the textbook or other sources of information about human geography, how much extra time might be needed to complete the language objectives, particularly with new terms that do not have any parallel in other courses? | | |

**Lesson 3:**

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| **Subject:** Social Studies 11  **Unit:** Sustainability and Human Geography Mini Unit  **Lesson Number:** 3 of 3  **Lesson Title:** Developing Understanding  **Time:**80 Minutes |
| **Prescribed Learning Outcomes:**   1. Human Geography: Population Distribution, Density, Freshwater Quality and Supply, Global Warming, Canada’s Standard of Living in Comparison to other countries. 2. Skills and Processes of Social Studies: Assessing Information, Ethical Behaviour, Open Mindedness, Collaboration. 3. Other: Critical thought and evaluation of topics related to current societal stances on food and water management and resource allocation |
| **Students Will Be Able To (SWBAT):**   1. Recognize connections between events and their causes, consequences, and implications (e.g., relate current events to historical contexts) (SS 11 - p. 30). 2. Explain how industrial and technological development can affect the environment (e.g., global warming and ozone layer depletion) (SS 11 - p. 34). |
| **Specific Language Objectives:**   1. Introduce students to Environmental/ Human Geography vocabulary and concepts. 2. Facilitate collaborative English learning and discussion. 3. Follow-up assignment to assess language comprehension and acquisition with worksheet on activity. 4. Practice terms like: distribution, density, and dependency ratio (SS 11 - p. 34). 5. Introduce concepts like the Kyoto protocol (SS 11 - p. 34). |
| **Materials Required:**   * A classroom with the ability to play a youtube video (laptop with projector or TV and appropriate hookups in the room). * A pre-printed definitions list or specific required definitions accessible up on the board/projector throughout the activity. * Matching Vocabulary worksheet * 5 poster boards or large sheets of paper * Articles on the 5 topics - current and relevant ones can be found at:   + Environment Canada: <https://www.ec.gc.ca/pollution/default.asp?lang=En&n=77BC2971-1>   + Conference of Parties website <https://www.cbd.int/cop/>’   + WWF Canada <http://www.wwf.ca/>   + National Oceanic and Atmospheric Administration (good for the Agriculture topic) <http://www.ncdc.noaa.gov/climate-information/climate-change-and-variability>   + United Nations website (Kyoto Protocol) <http://unfccc.int/kyoto_protocol/items/2830.php>   + Center for Climate and Energy Solutions <http://www.c2es.org/science-impacts/ipcc-summaries/fifth-assessment-report> |
| **Adaptations, Modifications, Extension Notes:**  **Adaptations**:   * Include more visual representations of climate change (show images, charts etc.) * Write key terms on the board, and include a handout with key terms on it   **Modifications**:   * Have a printout of key concepts and their meanings for students who have trouble notetaking * Let students work in groups to answer the end questions, so that students who have trouble reading or writing (dyslexia, dysgraphia, dyspraxia etc.) can have someone else write their group’s answers down   **Extensions**:   * Have bonus questions the students can answer if they finish the first ones early   Have a current article on climate change that students can read if they finish early (ex. about the Northern Gateway Pipeline) so they can see how climate change is impacting people and their decisions today in other ways (ie. whether to support the pipeline or not, or whether to move to Northern BC or not) |
| **Assessment Plan**:  Matching activity: Students will be given a worksheet to match definitions with terms. Five minutes will be allocated to complete these terms, and 5 minutes to discuss the answers as a class. The worksheet may be handed in and marked for completion/correctness.  Group Work and Presentation: Students will be generally assessed on how well their group worked together to discover more about their topic (completion marks may be given for example).  Question sheet: Students will hand in a written response to the questions at the end of class and will be marked on its completion or on the effort they put in to their critical thinking. |

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| Lesson Part | What I Will Be Doing | What the Students Are Doing |
| Part 1: 20 Minutes | “Today we’re going to build on what we started to talk about last class, this time, talking more about climate change and how it might affect resources and population density.”  Ask some discussion questions for a refresher of the previous lesson;  - What do I mean by “population density”?  - What were some of the things we did last class?  - What were some of the discoveries you made?  - Was there anything you learnt that really shocked you? Something you didn’t know before?  Present video: (3:27 minutes) and ask students to jot down initial thoughts or interesting facts:  [http://www.youtube.com/watch?v =OG5bWWBdO1E&feature=c4-overview&list=UU575w7dIjLvG Cnz4M1kgSsQ](http://www.youtube.com/watch?v=OG5bWWBdO1E&feature=c4-overview&list=UU575w7dIjLvGCnz4M1kgSsQ)  Ask students what their initial thoughts are on the video.  “What were the main points in the video?”  “What were the major issues it pointed out?” | Listening.  Participating in class discussion.  Watching the Video  Volunteering Answers |
| Part 2: 10 Minutes | Distributing Matching Activity  Going over answers with class | Completing Matching Activity  Volunteering Answers |
| Part 3: 15 Minutes | Write the following questions on the board:  Climate change is arguably one of the most important issues we face today. Why?  Where does it fit in with sustainability issues?  What kind of effects do you think climate change might have on resources?  What do you think this might do to international relations? Or what effects might it have on where people migrate to?  What effects might the limits to resources have on you specifically? | Copying down the questions.  Students should then pair with a partner (perhaps a clock buddy) and share their thoughts.  After students have had time to think about them, lead a brief discussion on some of these questions, specifically emphasising the effects limited resources might have on populations and population migrations.  By the end of the discussion, students should understand that:  - Climate change is going to limit resources, like water and food.  - Populations are going to increase, putting more stress on resources.  - A link exists between the climate’s imposed limits on resources and changes in personal consumption habits. |
| Transition/Set-up: 5 Minutes | Five different groups will be set up with a poster board that is labeled with a topic (either posters taped to the wall or on a group of desks). Students will be numbered off 1 to 5 and will go to their groups. | Within their groups, students will be randomly assigned a role (ex. “Could one person in each group raise their hand. You will be the writer for your group.”) *or* they can choose roles amongst themselves. Roles include: Director (keeps discussion on track), Consensus Tester (makes sure everyone is on the same page, asks for opinions of those who haven’t talked in a while), Writer/Summarizer/Clarifier, Presenter. (Note: there can be two presenters, or the writer position can be broken up into two positions depending on class numbers). |
| Part 4: 10 Minutes | Float around to each group and help them with guiding questions if they are struggling.  Topics:  Freshwater Quality and Supply  Industrial Pollution in Canada  Agriculture  The Kyoto Protocol  Conference of the Parties (COP)  For the first 3 topics, their main guiding question should be:  How will climate change affect this and how might that influence populations?  For the last 2 topics, their main guiding questions should be:  What is this? How is it influencing policies on climate change? | Students will be given a few minutes in their groups to write down anything they already know about the topic in relation to climate change. (If they find they know nothing about it that’s okay to!). Then they will be given articles based on their topic and they will research and discuss what they find. |
| Part 5: 10 Minutes | Providing Commentary on the various presentations. | The presenter(s) of each group will then share their findings with the class. Allow other students to ask the presenting group questions and help ask guiding questions. |
| Conclusion: 10 Minutes | Ask students to write a brief response to the following questions and hand it in at the end of class:  Thinking about what we learnt today, how do you think climate change will impact population density or where people migrate to? Where do you think populations will become more dense? What countries or continents might struggle more with the changing climate? | Writing Responses, leaving. |
| **Teacher Reflection**:  Was the group work on task?  Were the transitions between class discussions and small group/pair discussions smooth?  Were the instructions clear to all students? Could they have been made clearer?  Were there any timing issues? Did students need more time for a specific activity? | | |

1. Because this would be massive to print, we have it referred to here instead of included as resources for the lesson (a substitute teacher would have to copy them anyway). [↑](#footnote-ref-1)