LESSON TITLE: Pass on the Plastics?
SUBJECT/Grade: Gr. 9 Academic Geography
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Activity Overview

It's hard to imagine a world without plastic yet we see a world full of it and the increasingly negative press it's received in society. Recently, Canada was criticized internationally for dumping its "recyclable" plastics, all contaminated waste, on the doorstep of the Philippines; a common practice industrialized nations are resorting to for managing waste. We see photos and videos of marine life entangled in plastic debris and the Great Pacific "Garbage Patch" now grown larger than the size of Texas. Does plastic deserve its bad reputation? Can it play an important role in building sustainable communities? The set of activities in this lesson will allow students to learn more about plastics and determine whether society should pass on the plastics?

Overall Expectation(s):	Specific Expectation(s):
E1. The Sustainability of Human Systems: analyse issues relating to the sustainability of human systems in Canada **E2.** Impacts of Urban Growth: analyse impacts of urban growth in Canada **C1.** The Sustainability of Resources: analyse impacts of resource policy, resource management, and consumer choices on resource sustainability in Canada **C3.** Industries and Economic Development: assess the relative importance of different industrial sectors to the Canadian economy and Canada's place in the global economy, and analyse factors that influence the location of industries in these sectors.	**C1.1** describe strategies that industries and governments have implemented to increase the sustainability of Canada's natural resources **C1.3** analyse the influence of governments, advocacy groups, and industries on the sustainable development and use of selected Canadian resources **C1.4** analyse the roles and responsibilities of individuals in promoting the sustainable use of resources **C3.1** compare the economic importance of different sectors of the Canadian economy **E1.1** analyse the effects of food production practices, distribution methods, and consumer choices on the sustainability of Canada's food system **E1.4** analyse the factors that affect the social and economic sustainability of communities **E1.5** propose courses of action that would make a community more sustainable **E2.1** assess the impact of urban growth on natural systems

	E2.2 analyse various economic, social, and political impacts of urban growth

Catholic Graduate Expectation(s):

A Discerning Believer Formed in the Catholic Faith Community who:
CGE1d - develops attitudes and values founded on Catholic social teaching and acts to promote social responsibility, human solidarity and the common good
An Effective Communicator who:
CGE2a - listens actively and critically to understand and learn in light of gospel values;
A Reflective and Creative Thinker who:
CGE3b - creates, adapts, evaluates new ideas in light of the common good;
CGE3c - thinks reflectively and creatively to evaluate situations and solve problems;
CGE3d - makes decisions in light of gospel values with an informed moral conscience;
CGE3f - examines, evaluates and applies knowledge of interdependent systems (physical, political, ethical, socio-economic and ecological) for the development of a just and compassionate society.
A Collaborative Contributor who:
CGE5a - works effectively as an interdependent team member;
CGE5e - respects the rights, responsibilities and contributions of self and others
A Responsible Citizen who:
CGE7d - promotes the sacredness of life;
CGE7e - witnesses Catholic social teaching by promoting equality, democracy, and solidarity for a just, peaceful and compassionate society;
CGE7i - respects the environment and uses resources wisely;
CGE7j - contributes to the common good

Evidence of Learning (Assessment and Evaluation Plan):

- Students should have already met most expectations from the Unit Strand on Managing Canada's Resources and Industries and understand terms such as GDP, export, sustainability, industry, resource, carbon emission and footprint)
- Assessment for learning – Four Corners Survey, Gallery Walk and Plastic Recycling Game
- Assessment as learning – Co-constructing inquiry questions and responses (Google Slides); Self and peer assessment for opinion writing piece/letter to MP
- Assessment of learning – Evaluation of individual opinion piece/letter to MP; household plastics audit plan with reflection

Teaching/Learning Strategies

Introduction: Class Activity [20 minutes]
Use the four corners activity to assess how students feel and think about plastic in general. Designate one corner in each room as: Strongly Agree, Agree, Disagree and Strongly Disagree (to make it easier for students to remember, use one side of the room for Agree, and the other side of the room for Disagree). To learn about this facilitation method, visit: http://www.eworkshop.on.ca/edu/pdf/Mod36_coop_four_corners.pdf

Refer to the teacher handout, "FOUR CORNERS ACTIVITY: Survey on Plastic" (BLM.CGC9.2.1.1). Read the statements out loud, then give students a minute to move themselves to the appropriate corner based on their response. After everyone moves you can give students an opportunity to explain why they chose the corner they did, or you may simply move onto the next question. Inform students that these questions will touch on some of the topics they will learn later on in the lesson.

Video and Group/Class Activity [15 minutes]
Play the CBC video, Power & Politics: Canada hires company to bring back garbage from Philippines (watch up to 2:18). The video can be found here: https://www.youtube.com/watch?v=lvFBrGUdyaI

Ask students to discuss the following questions in groups (or as a class):
1. Why do you think the Philippines accepted roughly 100 shipping containers of "recyclable material" from Canada? Do you think this is a fair practice? Explain.
2. What was the problem? Why were so many Filipinos protesting against Canada?
3. Do you think the President of the Philippines, Rodrigo Duterte, had a reasonable and/or effective response given the problem existed for several years? Explain. (Reaction: Philippines pulled their diplomats from Ottawa, would possibly declare war, and threatened to ship all the containers back and dump them in Canadian waters)
4. How can we/Canada prevent this from happening again? Who should bear the greatest responsibility? (i.e. recycling companies who ship wrong material overseas, the Canadian government who has no laws holding these companies responsible, or consumers who produce all the waste in the first place?)

This news drew a lot of negative media attention for Canada at an international level. It highlighted the current waste crisis and need for better management, especially for recyclables and plastics. One of the solutions the Canadian government announced recently was banning single-use plastics by the year 2021.

Focus Inquiry Question: Group/Class Activity [15 minutes]
Write on the board or verbally ask: Should the Canadian government ban single-use plastics? Share the focus inquiry question above with students and then ask the following prompt: Before making such an important choice, what questions should citizens ask the government to make sure their decision is informed?

Students will brainstorm in groups and/or develop a list of inquiry questions as a class that can be posted on the wall. You can ask student groups to record their thoughts on a chart paper. As you progress through the lesson, the class can check off the questions once they've answered them through the next set of activities.

See the slide presentation, "Plastics Lesson: Inquiry Questions" that you may show students to debrief after the activity. Most of the questions they developed will probably be variations of the main ones shown in the slides. If can be found here: https://www.slideshare.net/PASSOC/plastics-lesson-inquiry-questions

The next series of activities will help students develop answers to their inquiry questions.

The Plastic Life Cycle: **Video: Plastics 101 by National Geographic [6 minutes]**

1. Show the video, "Plastics 101: National Geographic" (up to 3:11) found here: https://www.youtube.com/watch?v=ggh0Ptk3VGE. This video will expose students to the plastic life cycle.
2. Show the diagram on the Materials Recovery Facility found here: https://www.dakotavalleyrecycling.org/other-residential-recycling/330-how-a-materials-recovery-facilities-works
3. Show them the image of a typical plastics recycling plant: "From Trash to Cash" found here: http://www.wasteauthority.to/managing-waste/reduce-reuse-recycle after so students learn what is involved in the process of managing plastics recycling. Now students will explore different themes of learning about plastic based on the video they watched.

"Expert Groups" [45 min]
Break the class into 7 groups. This will be their "expert group" studying artifacts at their given table. Each member will learn about a specific topic or theme related to plastic and share it by answering any of the inquiry questions developed by the class. You will need to share the link to the collaborative slide presentation "Inquiry Questions" that you may download from here: https://www.slideshare.net/PASSOC/plastics-lesson-inquiry-questions. One person in each group will need to

use a device (cell phone, tablet, laptop, etc) so their group can record the most important information from their artifact under the inquiry question it connects to. Note the artifacts come from various sources: government, non-profit, national and international media outlets, and academia. Artifact 1 requires some numeracy skills, Artifact 3 would be good for visual learners (less reading with an infographic), and Artifacts 5 to 7 articles that use academic language.

Artifact 1	The role of plastic industries in the Canadian economy (charts, statistics from Government of Canada)
Artifact 2	Global News article, "Plastic Industry Major Economic Driver in Canada" (personal device required to view video)
Artifact 3	Greenpeace article Canada's Top Plastic Polluters (includes infographic)
Artifact 4	Deutsche Welle (Germany), Globe & Mail articles on Canada's single-use plastic ban
Artifact 5	Alternatives to Plastic (Our World in Data research, University of Oxford)
Artifact 6	Plastic Recycling & Breakdown (Our World in Data research, University of Oxford)
Artifact 7	Global Plastic Production & Fate (Our World in Data research, University of Oxford)

Give groups time to read and discuss their artifacts, and post their findings on the collaborative slide presentation. During this time, you may need to assist certain groups in processing the most important information. (20 minutes)

Afterwards, go through each Inquiry Question as a class and ask a student representative from each group to present any information they posted from their article (20-25 minutes).

Gallery Walk [25 minutes]
Print and post the images in from the slide presentation "Gallery Walk - Impact of Plastics" found here: https://www.slideshare.net/PASSOC/passoc-gallery-walk-impact-of-plastics. Tell students they will be given 5 minutes to walk around the room and look at the photos. They will be given 3 different coloured sticky notes (e.g. yellow, pink, green) where they can write a response to prompts.

Gallery Walk Sticky Note Prompts:
Colour A - I see…
Colour B - I wonder…
Colour C - I think/I feel...

If your class has never done a gallery walk before, choose one image to do together, to model the three types of prompts. After everyone has had a chance to post at least one sticky note of each colour, then the teacher can go through each image sharing the comments and observations (in the same order as the slides). For debriefing, see the notes in the slides (under each image) which explain the context of the photo and include reflection prompts.

Assessing Our Plastic Production and Management: Slides & Game [60 minutes]
From the previous two activities, Expert Groups and Gallery Walk, we can see there's a significant amount of plastics, much of which doesn't get recycled. Go through the slide presentation: "Assessing Our Plastic Production and Management" with the class, which can be found here:
https://www.slideshare.net/PASSOC/assessing-our-plastic-production-and-management
This presentation includes the Plastic Recycling Game. Please use the notes under the slides to guide your presentation.

You will need audio speakers for a brief video on one slide. Another slide involves visiting an interactive website that students can do on a personal electronic device or you can lead it with the class by projecting it.

What Can You Do?
Students will now have an opportunity to explore what they can personally do to help solve the plastics problem. Here are three options for activities:

1. **[10 minutes]** Give students the following link (or printed article) to quietly read the reflection, "Do a Plastic Audit". You can also ask them to close their eyes as you read and to focus on your words in mindfulness meditation: https://dabblinggreen.com/do-a-plastic-audit/
2. **[15 minutes]** After their quiet audit meditation, give them the link to the online Plastic Calculator where they will assess how much plastic they use in their household https://www.earthday.org/plastic-calculator/ -or-
3. **[30 minutes]** If you have class time and prefer that students practice their numeracy skills, they can do their own plastic calculator on paper. You may print and copy from the following toolkit: http://160g7a3snajg2i1r662yjd5r-wpengine.netdna-ssl.com/wp-content/uploads/Plastic-Pollution-Calculator-Plan-and-Tracker.pdf

Show students the infographic, "9 Tips for Living with Less Plastic" (see link below). Ask them to complete page 7 of the Plastic Pollution Calculator Plan and Tracker (you could also assign pages 9 and 11 if you prefer a more extensive audit: https://lessplastic.co.uk/9-tips-living-less-plastic/

Assessment/Evaluation
Now that students have answered all the inquiry questions through the learning activities, they should now feel more prepared to respond to the Focus Inquiry Question: Should Canada ban single-use plastics? Tell students that this is a good opportunity for them to develop their opinion writing skills. Review the "Oreo/Hamburger model" and give them a template. If you are unfamiliar with this message, you can find a video of the OREO model here: https://www.youtube.com/watch?v=ZTWXWVvSpa0. They can take time to develop their ideas and arguments in an outline. Encourage them to look at the class "Inquiry Question Slides" for details to support their position. You can either assign the writing as a homework activity, or you can do it as an in-class assignment. Writing this opinion piece will serve as practice for the OSSLT (Ontario Secondary School Literacy Test).

As well as **templates for writing an opinion outline** here:
Scholastic Graphic Organizers for Opinion Writing
OREO Opinion Writing Graphic Organizer

If you would like to do this assessment as practice for the OSSLT, please show students sample writing ahead of time with the expectations (i.e. code 10 to code 60 - successful criteria using OSSLT exemplars): http://www.eqao.com/en/assessments/OSSLT/assessment-docs/OSSLT-SG-2014.pdf

Here is a great rubric for opinion writing that can be used for self/peer assessment: https://www.empoweringwriters.com/wp-content/uploads/2015/02/Opinion-Rubric.pdf

Extension: Write to Your Member of Parliament [45 minutes]
Another variation for this assessment is an opinion paragraph as a letter to their MP. Students would still need to have an introduction to their letter, three paragraphs for the body of their letter, and a concluding statement for their letter. Letters can be mailed, free of charge to their MP, if it is addressed to Parliament Hill. This exercise would also be excellent practice for the OSSLT.

To find a MP for a riding, please visit: https://www.ourcommons.ca/Parliamentarians/en/constituencies/FindMP

Differentiated Instruction and Accommodations/Special Needs:

- These lessons are designed to meet diverse learning needs of students through multiple intelligences (kinesthetic, visual, verbal, inter/intra-personal, logical, nature)
- Please pair IEP/ELL students with helpful peers for activities like the plastic audit. Take into account the considerations mentioned previously for the Expert Groups Artifacts activity. Give extra time and assistance to students for writing their opinion piece/letter.
- Consider putting a word bank on your wall to help students with new/difficult terms

Learning Materials

- You will need a computer projector and audio speakers
- For some activities it would be helpful for students to use devices (at least one per group)
- Please print all the Artifacts
- Make a copy of the Inquiry Questions Google Slide file and be prepared to share the link with editing access for students
- You will need 3 colours of sticky notes for the Gallery Walk activity
- Please print pg. 7 (and possibly 9, 11) of the Plastic Pollution Calculator Plan & Tracker
- Please print the Opinion Writing template to give as handouts for students to create their outline
- Please make copies of the self/peer assessment rubric for the Opinion writing.

Elements of 21st Century Learning

The activities in this lesson connect to the following 21st century competencies (TCDSB NeXt Lesson):

- Knowledge Construction and Collaboration through inquiry-based learning
- Real-World Problem Solving and Skilled Communication through letter writing to MP
- Self-Regulation intrapersonal, interpersonal and cognitive competencies through plastic audit (setting and/or tracking goals in plan)
- communication technologies (ICT) to facilitate teaching and learning (Google inquiry slides)
- global citizenship among the learners

Resources

ARTICLES

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ADDITIONAL RESOURCES

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Teaching Notes

- For all group work activities, ask students to take on a specific role: **facilitator** (to lead the discussions and encourage everyone to participate), **writer** (to record notes), **presenter** (to debrief with class after activity), **timer** (to ensure everyone stays on task)

- Prompt students to always **consider bias** that may exist whenever presented with new material (e.g. articles, images, etc.) and how reliable the source of information is

- As an alternative or addendum to the Plastic Recycling Game slides, ask students a week before this lesson to collect plastics from home and bring them into class. You can use real samples instead of just images for guessing and this will also give students a better idea of what plastic is mostly commonly used.

FOUR CORNERS ACTIVITY: Survey on Plastic

1. Students should be allowed to use plastic water bottles in schools.

2. Stores should charge more than 5 cents for plastic bags.

3. I confidently know what can go in the blue recycling bin.

4. At home my family does a good job sorting their waste into recycling, compost and garbage.

5. At school students and staff do a good job sorting their waste into recycling, compost and garbage.

6. Most of the items that cities collect in blue bins actually get recycled.

7. The plastics industry is important in Canada's economy.

8. The government should ban all single-use plastics.

9. Plastics are destroying our environment in a way that we can't reverse their effect.

10. I can make a big difference in helping the environment with the choices I make.