Ecological Impact of Human Tourism

Created by

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Grade and Subject Area

Grade 12

Biology: Population Dynamics

Duration

Two 75-minute periods

Hope Statement

Our hope for students participating in this lesson is that they can research and understand the effects of human activity on ecosystems around the world and how our ecological footprint can have cascading effects on an ecosystem. We hope that students will become more conscious of their impacts on the environment and more mindful of their everyday practices.

Acknowledgements

This lesson was created by **teacher candidates in the Environmental Education concentration** of the Faculty of Education, Queen's University (2024-25), instructed by **Dr. Heather McGregor**. The lesson belongs to a set of lessons created by the class to demonstrate how teachers can be inspired in their climate teaching by youth-created art or stories. **The art and stories created by youth (grades 7-12)** and these lessons aim to help students imagine a positive future in the face of climate change—a future without the use of fossil fuels, where biodiversity is restored, and where humans live in caring communities. The art and stories in these lessons were created for the **Youth Imagine the Future** festival in Kingston, Ontario.

Thanks to **Jerri Jerreat and the Youth Imagine the Future team** for supporting this lesson plan initiative, and securing permission to use these art works and stories.

Thanks to **April McInnes** for designing the lesson plan template.

Thanks to the **Environmental Sustainability Committee of the Faculty of Education** for their support.

We hope teachers will be as inspired by young people's visions of the future as we are!

Our Inspiration

Artist Statement
In the future, we will have clean oceans and less pollution as well as have sustainable ways to package products other than plastic so that we can reduce waste. The outside of the goggles shows garbage found in oceans while the inside of the lens show a healthy coral reef. When you look through the goggles, you can imagine a bright future where pollution is eliminated and no waste floats around.
- Amélie Robitaille

Lesson Context

Guiding Questiona
What ecological considerations would one need to be aware of before travelling for tourism purposes? How do human activities impact local and/or global ecosystems at a variety of levels, and what steps can we take to minimize our ecological footprints?

Curriculum Objectives
SBI4U - Grade 12 University Biology

1. **F1.1** analyze the effects of human population growth, personal consumption, and technological development on our ecological footprint (Ontario Ministry of Education, 2008, p. 86)
2. **F3.5** explain how a change in one population in an aquatic or terrestrial ecosystem can affect the entire hierarchy of living things in that system (Ontario Ministry of Education, 2008, p. 87)

Our Environmental/Climate-focused Learning Outcome
Students should be able to analyze the effects that human activities, especially those associated with tourism, have on local and global ecosystems. Students should be able to identify ways they can minimize their ecological footprint, both in tourism and everyday contexts.

Lesson Overview
These lessons are set near the end of the SBI4U Population Dynamics unit. The lessons are planned to take place a few days apart (e.g., Monday and Thursday) so that the students have enough time to complete their research assignment. Halfway between the two lessons, teachers should conference with the students to discuss how their research is going, if they need any assistance, their presentation due date, etc. There are curriculum expectations and content that we are assuming the students have previously learned during this unit, such as specific terminology and concepts regarding ecosystem sustainability and population growth.

We have also designed this lesson plan with the consideration that teachers' classrooms and students are unique! Please feel free to modify the content to better fit the needs and interests of your class.

Lesson #1
(75 mins)

Materials Required

- Laptop/computer, projector, and screen
- Pictures of Amélie Robitaille's art (Appendix A)
- PowerPoint Lesson (Appendix B)
- Research Assignment Instructions (Appendix C), Template (Appendix D), Rubric (Appendix E), and Exemplar (Appendix F)
- Cue cards

Hook (5 mins)

Begin the lesson with a Think, Pair, Share activity centred on student bucket list travel destinations and how these plans involve human impacts on the natural world.

Think: Have students think individually about their travel bucket list. If they could travel anywhere, where would they go? What would they do there? How are these locations impacted by human activity?

Pair: Have students discuss their bucket list destination and their ideas of how human activity affects this location with a partner.

Share: Discuss as a class where everyone wants to travel. Ask students if any of these locations are at risk of changing or being negatively affected in some way due to human activities. Use this discussion to introduce the idea that some of these places might be in jeopardy due to current human activities and practices related to their daily lives. For example, students may want to consider urban development, habitat loss, and pollution.

Activity: Show the Artwork (5 mins)

Show the pictures of Amélie's art piece to the class and ask the students to share their thoughts on it. You can ask the students to share what they notice and wonder about the art, and/or to describe their thoughts in three words or phrases.

Lesson Presentation (40 mins)

Guide students through the PowerPoint lesson focused on human activities and human impact on ecosystems. The main human activities the lesson focuses on are plastics and pollution, habitat fragmentation, climate change, and agricultural practices. From there, the concept of ecological footprint will be defined and discussed in the context of ecotourism. The end of the lesson will focus on travel and tourism, and the environmental impacts of transportation, tourism activities, and species and community interactions.

Ensure there are multiple opportunities for students to ask questions within the lesson. Furthermore, be cognizant that discussion of human activities and their impact on ecosystems can be emotionally challenging for students and can spur feelings of climate anxiety. Ensure that students feel supported within the lesson and that they are connected with school supports if need be.

Activity: Moving Four Corners and Class Discussion (10 mins)

Designate four corners (or other distinct areas) in the classroom to be “strongly agree,” “agree,” “disagree,” and “strongly disagree.” Choose a few prompts and ask students to stand in the corner that they feel best represents their thoughts. You can ask a few students to share their reasoning for why they chose their corner.

Moving four corners prompts:

- I enjoy travelling or exploring new places.
- I travel or explore new places often.
- I think I have a high ecological footprint.
- Before visiting a new place, I research the existing ecosystem interactions that are present.

Lead a discussion with the class to discuss the pros and cons of tourism with a focus on environmental considerations. You may choose to do this as part of the four corners activity and ask students to share their experiences and/or justify their decisions. Or, you may decide to lead a discussion after the students have returned to their seats.

Sample prompts for the class discussion:

- Why do people travel?
- What are some things you might consider when planning a trip?
- How do you think human activities impact existing environments and ecosystem interactions? Is there anything that we can do about this?
- Why don’t most people consider their ecological impact during the planning process?
- If you were to consider your possible ecological impacts, what steps might you take when planning and participating in a trip?

Consideration: Some students may not have travelled internationally, so ensure that students know that travelling locally (e.g. to Niagara Falls, a nearby city) is also considered travelling.

Conclusion: Introduce Research Assignment and Exit Ticket #1 (15 mins)

Introduce the research assignment to students and provide a paper copies of the assignment, research template, and rubric. Go over the exemplar as a class and explain the presentation component for the next lesson to ensure that the assignment expectations are clear to the students (the exemplar cannot be used as their topic). Give students a few minutes to think about what they are interested in researching and create groups for the assignment.

Give out an exit ticket to the students to get them thinking about their assignment. Each student will write their name and the answers to the following questions on a cue card:

- Where are you thinking of travelling?
- What activity will you be doing there?

Lesson #2
(75 mins)

Materials Required
- Laptop/computer
- Projector and screen
- Pictures of Amélie Robitaille's art (Appendix A)
- Cue cards

Small Group Presentations (50 mins)

Students should have finished their assignment, which requires them to compile their research into a visual slide deck. Students will be placed into groups of 5, where each student will have chosen a different topic for their project. Each student will have 8 minutes to share their research and slide deck to their small peer groups. Students will be assessed on their research quality and the visuals that they submit to the classroom Dropbox, not on their individual presentation skills.

Class Discussion (15 mins)

Lead a class discussion to debrief what everyone learned from researching their own assignment and from listening to other students' presentations.

Sample prompts for the class discussion:
- Did you notice any common trends among the species that may be impacted in the different presentations? What were they?
- What are some best practices for travelling in a sustainable manner?
- Do you think that wanting to travel but putting the ecological environments you are travelling to at risk is an ethical dilemma?
- Was there anything else you found surprising?

Activity: Back to the Artwork, then Beyond (5 mins)

Ask the students to reflect on what they've learned about their chosen destination and hearing from their peers. Show the pictures of Amélie's art piece to the class again, but ask the students if their feelings towards it have changed. The class can also briefly discuss what they might modify about what was depicted in the goggles (inside and outside) to be more representative of the research that they did and explain why these changes make sense.

Conclusion: Exit Ticket #2 (5 mins)

Distribute an exit ticket to encourage students to share their practical takeaways. Each student will write their name and the answers to the following questions on a cue card:
- What was something interesting you learned about someone else's presentation?
- What do you think is the best / most realistic change that people can take to travel in a more eco-conscious and eco-friendly way?
- What else do you still want to learn?

Assessment and Accommodation

Assessment Description

Students will select a destination from a provided list or get approval for one of their own choosing. Using the provided research template, students will research logistics around planning the trip and research any ecological considerations that they should keep in mind when travelling to their chosen destination.

They will compile their research into a digital presentation, then present it to their peers as part of the second lesson. On this day, students will be placed Into groups of 5 where each student has a different topic. Each student will be given 8-10 minutes to present to their peers. Students will be assessed on the quality of their research in the presentation visual that they submit to the classroom Dropbox, not their individual presentation skills.

Accommodation Suggestion

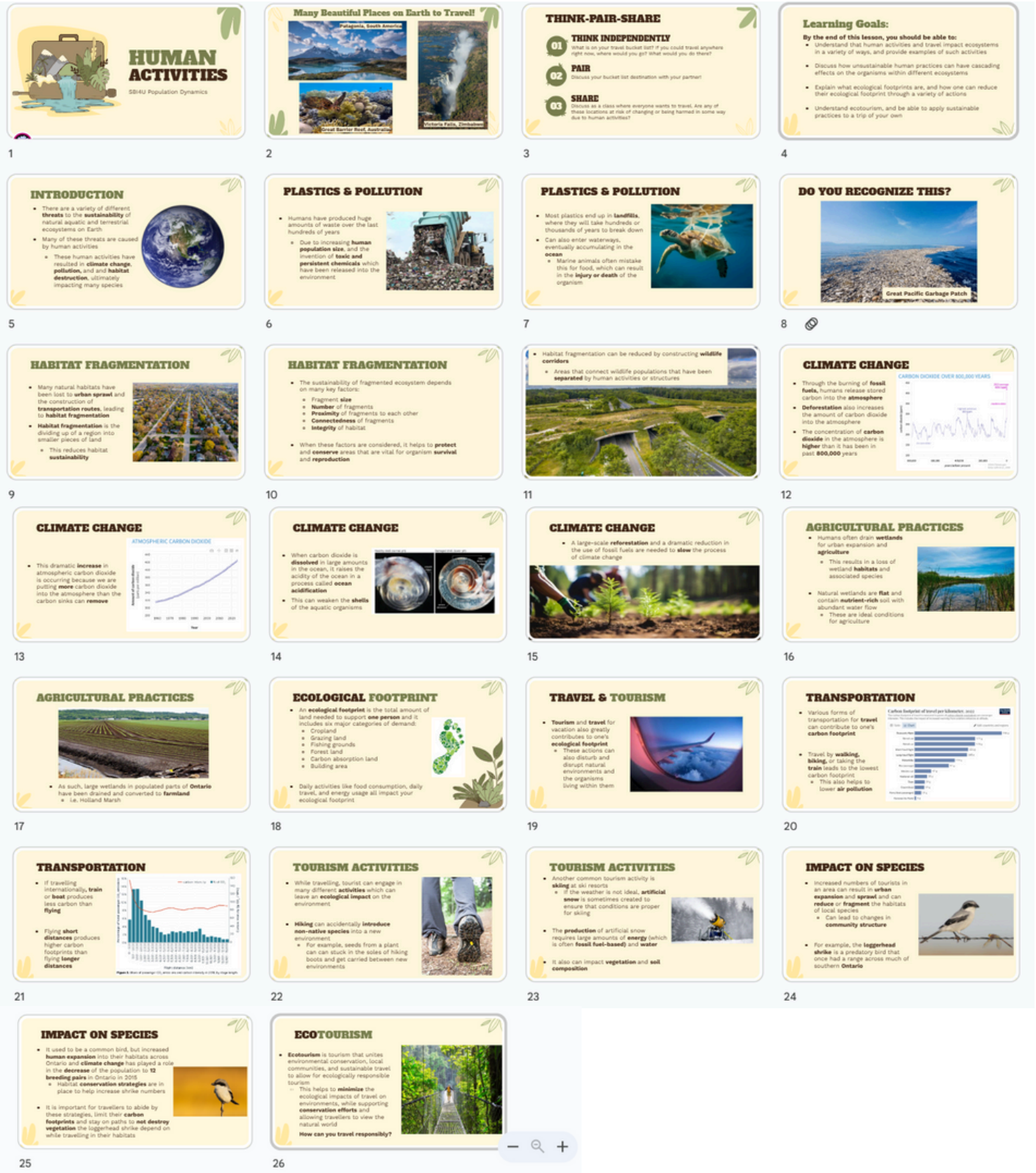
Some accommodations for this assignment include:

- **Extra time**
  - Although this lesson was designed to be completed in two classes, groups with students that have IEPs or extenuating circumstances could present their work at an alternative time.
- **Choice of format**
  - Students can choose to complete the research template with paper and pencil or a computer.
- **Presentation options**
  - Students who prefer to not present to larger groups could present to just the teacher or record their presentation ahead of time.

Appendix A
Amélie Robitaille's Art Piece

Appendix B
PowerPoint Lesson

[Click Here to Access the Human Activities PPT]



Appendix C
Research Assignment Instructions

Click Here to Access the Research Assignment Instructions, Template, Rubric, and Exemplar

Name:_____ Due Date:_____

Plan your own trip! - Individual Research Project

Imagine you are an avid traveler looking for your next adventure. Considering that you are an active and nature-loving individual, you will need to find an outdoor destination and an activity you can do while you are there. Using the research template, you will plan your trip and examine any ecological considerations for your chosen destination.

After completing your research, you will be responsible for compiling your research into a slide deck. Add all references used to a bibliography on the last slide in APA format. You will be put into groups of five students, and each student will have 8 minutes to share their research with their peers. Please submit a digital copy of your slide deck to the dropbox. You will be assessed on what you submit, not on your presentation skills.

Choose a destination that has a diverse ecosystem and may be impacted by human activity. There are some great examples below, but if you would like to choose a different destination you must get it approved by the teacher before beginning your research.

Examples of destinations:

- Yellowstone, Wyoming
- Costa Rica
- Desert Sand Dunes, South Africa
- Galapagos Island, Ecuador
- Algonquin Park, Ontario
- Alaska, U.S
- Rwanda
- Banff, Alberta
- New Zealand
- Mexico

Appendix D
Research Assignment Template

Research Template:
While conducting your research, use this template to ensure you are collecting information that will be assessed.

LOGISTICS (~1 minute)

1. What location are you travelling to? Why did you choose this destination?

2. Where will you be staying? How long will you be staying there?

TRANSPORTATION (~2 minutes)

1. What transportation will you require to get to and around your destination? Why did you choose this mode of transportation?

2. How long will it take you to get there? And how might your transportation impact your carbon footprint?

CHOSEN ACTIVITY (~2 minutes)

1. Select one outdoor activity that you will be participating in (e.g. hiking, snorkeling, etc.), and describe where you will be going and what you will be doing (including any equipment you may need).

2. How would your chosen activity impact the ecosystem and the physical environment (consider any equipment used)?

SPECIES IMPACT (~2 minutes)

1. Pick one species that naturally occurs in that ecosystem. If that species were to disappear, how would that affect the ecosystem's community structure?

2. What is the conservation status of this species from the International Union for Conservation of Nature (IUCN)?

CONCLUSION (~1 minute)

1. What are two ways that you could travel more sustainably while still enjoying your vacation?

REFERENCES (APA)

Appendix E
Research Assignment Rubric

Rubric:

	Areas for Improvement	Criteria *Standards for This Performance*	Evidence of *Exceeding Standards*
LOGISTICS		The student has demonstrated extensive consideration of their travel plan, and justification for their plan.	
TRANSPORTATION		The student has selected an appropriate choice of transportation with justification and has accurately described the impact of their choice on their carbon footprint	
CHOSEN ACTIVITY		The student has selected and described an appropriate outdoor activity and considered the ecological and environmental impacts of that activity.	
SPECIES IMPACT		The student has highlighted an accurate example of a species in their chosen destination, why that species is important to the ecosystem, and indicated the species status.	
CONCLUSION		The student has provided two relevant ideas to practice sustainable travel.	
REFERENCES		The student has included a slide of their references at the end of their slide deck in proper APA format.	

Appendix F
Research Template Exemplar

Research Template:
While conducting your research, use this template to ensure you are collecting information that will be assessed.

LOGISTICS (~1 minute)

1. What location are you travelling to? Why did you choose this destination?

We will be going to Cairns, Australia. We chose this destination because we want to see the Great Barrier Reef!

2. Where will you be staying? How long will you be staying there?

We will be staying at the Thala Beach Nature Reserve for 2 weeks.

TRANSPORTATION (~2 minutes)

1. What transportation will you require to get to and around your destination? Why did you choose this mode of transportation?

We will require a few modes of transportation to get to our destination:

- Drive from Kingston, Canada to Toronto, Canada (263 km).
- Fly from Toronto, Canada to Vancouver, Canada (3355 km).
- Fly from Vancouver, Canada to Brisbane, Australia (11,915 km).
- Fly from Brisbane, Australia to Cairns, Australia (1700 km).

We will require public transportation and taxis to get around our destination.

We chose a plane as it is the only reasonable option to get to somewhere that is so far away.

We chose public transportation as it is a cost-effective and eco-friendly way to get around our destination.

2. How long will it take you to get there? And how might your transportation impact your carbon footprint?

It will take about 2 days to get there. It will likely make our carbon footprints much bigger as planes produce a lot of greenhouse gases.

CHOSEN ACTIVITY (~2 minutes)

1. Select one outdoor activity that you will be participating in (e.g. hiking, snorkeling, etc.), and describe where you will be going and what you will be doing (including any equipment you may need).

We will be snorkelling in the Great Barrier Reef. We will need a tour guide and snorkeling equipment.

2. How would your chosen activity impact the ecosystem and the physical environment (consider any equipment used)?

Snorkeling is generally considered to be a fairly eco-friendly activity, however, it is important not to disrupt corals by touching them and to wear a reef-friendly sunscreen.

SPECIES IMPACT (~2 minutes)

1. Pick one species that naturally occurs in that ecosystem. If that species were to disappear, how would that affect the ecosystem's community structure?

One species that naturally occurs in that ecosystem is the Bumphead Parrotfish. If they were to disappear, it would be detrimental to the corals making up the Great Barrier Reef. Bumphead Parrotfish selectively eat fast growing coral species over slower growing species, helping to maintain diversity in the Great Barrier Reef. Without them, diversity would be lost and the ecosystem would be damaged.

2. What is the conservation status of this species from the International Union for Conservation of Nature (IUCN)?

The Bumphead Parrotfish is considered ***Vulnerable***.

CONCLUSION (~1 minute)

1. What are two ways that you could travel more sustainably while still enjoying your vacation?

- Opt for a bus to the airport and use exclusively public transportation/bicycle sharing programs to get around Cairns.
- Snorkel responsibly! (Don't touch the reefs and use reef-friendly sunscreen.)

Reference

Ontario Ministry of Education. (2008). *Science (Biology, Grade 12, University Preparation)*. Curriculum and resources. https://www.edu.gov.on.ca/eng/curriculum/secondary/2009science11_12.pdf