

# Journey Towards a Waste-Free Lifestyle – A Grade 3-7 Teacher’s Guide on going Waste-Free

Prepared by:



Sponsored by:



## **Introduction**

Welcome to the Grade 3-7 Teacher’s Guide to a waste-free lifestyle. Our intent is to help students take action on climate change and overcome wasteful habits, by providing them with the information and resources to get started on a waste-free lifestyle early. By ensuring young Canadians are aware of how important it is for all of us to do our part, we will have moved steps closer towards a cleaner, healthy, and more sustainable environment. Everyone has a role to play.

The impact that our waste has on our surroundings depends on the personal actions that we take. When we incorrectly dispose of waste and consume single-use products it leads to countless items being tossed into the landfill. Plastic items in the landfill will take millions of years to break down while other kinds of waste will release greenhouse gas emissions. Reducing the amount consumed and diverting waste away from landfills is a task that we can all accomplish to keep the planet clean for future generations.

For you, this Teacher’s Guide is packed with facts, resources, and a presentation outline to support your students’ curiosity and extend their learning. We hope you will find this material useful for introducing your students to the importance of a waste-free lifestyle.

## **Purpose**

To introduce the concepts of a waste-free lifestyle, single-use and reusable items, consumerism, and waste reduction and diversion.

## **Goals**

The message here is that we need to incorporate sustainable practices into how we handle our waste as poor waste management and single-use items pollute our environment. Wasteful habits and misinformation are leading to recyclables and compostable materials to be thrown in the trash, contributing to the approximately 152,600 tonnes of waste that Londoners produce annually. London’s landfill will reach capacity by 2024 without interventions, so it is fortunate Green Bin program is expected in 2022 as one strategy to prolong the landfill. By teaching students about waste reduction and diversion, we aim to decrease the amount of waste that is sent to the landfill and inspire them to take action in their own homes and neighbourhoods.

Please note materials include a TREA online survey for children to calculate a household potential carbon footprint reduction, an activity book with different exercises for various ages to help increase their understanding and motivation for waste-free behaviour, a classroom presentation and an online workbook for each family to address waste management. After completion, we envision students will be more conscious of how they manage their waste.

## **Learning Outcomes**

By following this guide, teachers can:

- Ensure that students have the information they need to understand the complexity of the issue and that any prior misinformation they may have had on the topic is dispelled.
- Inspire students to take initiative when it comes to sustainable practices and managing waste at home and school.
- Provide the students with a study component to expand their knowledge on the topic outside of school.

By following this guide, students can:

- Develop steps that they can take to reduce and divert waste in their lives
- Independently identify and find solutions for wasteful practices within and around their surroundings
- Communicate the issue to others and how they can improve upon their waste management skills

## **Connections for Grade 3-7 Students**

- Grade 3 Science and Technology

<http://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf>

Our program relates to the overall and specific expectations of the grade 3 science curriculum. In terms of the growth and changes in plants, students will learn about how resource extraction of trees impacts our environment. They will also find out how trees are responsible for removing carbon dioxide from the atmosphere. As for soils in the environment, students are taught how composting helps with soil fertility, microorganisms in the soil, as well as how composting benefits plants.

- Grade 4 Science and Technology

<http://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf>

Our program relates to the overall and specific expectations of the grade 4 science curriculum. In terms of habitats and communities, students will learn how human activities impact the environment through climate change, plastic pollution, and the development of landfills. Methods to reduce our effect on these habitats will also be provided such as composting,

recycling, and reducing waste, in order to mitigate resource consumption and extraction, and development. During our composting lesson, students will also be taught how decomposers and compost plays a role in creating a healthy ecosystem.

- Grade 5 Science and Technology

<http://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf>

Our program relates to the overall and specific expectations of the grade 5 science curriculum. In terms of the human organ system, students will learn how our wasteful behaviour is impacting our health through landfills and reliance on plastic. The topic of forces acting on structures and mechanisms ties into discussions about climate change and how it will alter average weather patterns. Furthermore, the topic of properties and changes in matter is involved since students will learn about how each step for creating disposable items negatively impacts the environment. Lastly, conservation of energy and resources is covered when explaining why we need to reduce and divert our waste to preserve resources and prevent the long-term impacts of over-consumption.

- Grade 6 Science and Technology

<http://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf>

Our program relates to the overall and specific expectations of the grade 6 science curriculum. In terms of biodiversity, students will learn how improper waste management and resource extraction is leading to a decline in biodiversity. Students will also learn how we are using biodegradable materials to replace disposable items and how these biodegradable materials are often derived from plants. Furthermore, electricity and electrical devices will be covered when discussing how disposable items require large quantities of energy to continually manufacture them. Students will learn how we can save on energy by using reusable items which reduce the need for disposable item production.

- Grade 7 Science and Technology

<http://www.edu.gov.on.ca/eng/curriculum/elementary/scientec18currb.pdf>

Our program relates to the overall and specific expectations of the grade 7 science curriculum. In terms of the interactions in the environment, students will learn about the impacts of consumerism. We will also discuss how they can mitigate the impacts through recycling, composting, and living a waste-free lifestyle. The program will also cover decomposers and how matter is cycled within the environment. The topic of form and function is taught when looking at the social, economic, and environmental factors surrounding renewable and disposable items.

- Grade 7 Geography and History

<http://www.edu.gov.on.ca/eng/curriculum/elementary/sshg18curr2013.pdf>

Our program relates to the overall and specific expectations of the grade 7 geography curriculum. In terms of the physical patterns in a changing world, students will learn how our over-consumption is changing the physical landscape through landfills, resource extraction and climate change. Natural resources around the world are covered when looking at how reusable items reduce the amount of natural resources we consume in comparison to disposable items. Students will also learn about the average Canadian consumer's behaviour and how climate change impacts us on a global scale. Responses to excessive use of resources are explained to students through recycling, composting, and living a waste-free lifestyle.

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## **1.0 Getting Started**

### **1.1 What is Climate Change?**

Climate change is a permanent shift in the “average weather” of a specific region. Shifts in the “average weather” include changes to the temperature, frequency of storms, wind patterns, and precipitation. The rate and magnitude of global climate change over the long term have many implications for the natural ecosystems that sustain life on Earth. These implications are extreme weather events, such as tornadoes and hurricanes, ocean acidification, melting ice sheets, and rising sea levels. It is also expected to make it more difficult to grow crops in certain regions as the weather becomes more unpredictable. Climate change is expected to have far-reaching social, environmental, and economic impacts worldwide.

One of the key reasons behind the changing climate is increasing amounts of greenhouse gases such as carbon dioxide, within our atmosphere. Greenhouse gases contribute to climate change by trapping the sun's heat and warming the planet. Human activities such as the burning of fossil fuels, are the primary cause of the increase in greenhouse gases.

There are **5 greenhouse gases** that are the primary culprits behind climate change:

**Water Vapour** is by far the most abundant greenhouse gas and is the overall largest contributor to climate change. Unlike other greenhouse gases, water vapour does not remain in the atmosphere for long; it is brought back down to the surface through the water cycle. Its quantity in the atmosphere is not directly linked to human activity. However, as the planet warms through the addition of the other 4 greenhouse gases, more water will evaporate and stay in the atmosphere. Thus, we can reduce the amount of water vapour in the atmosphere by finding ways to cut back on the other 4 greenhouse gases.

**Carbon dioxide** is the biggest contributor of greenhouse gases that is directly linked to human activity. It is released by burning fossil fuels, solid waste, and trees. Plants can remove carbon dioxide from the atmosphere by converting it into oxygen through a process known as photosynthesis. Currently, there are not enough trees to manage the amount of carbon dioxide released by human activity.

**Methane** may be less abundant than carbon dioxide, but it is far more potent, it warms the planet 86 times more than carbon dioxide. Common ways that it is released into the atmosphere are through organic waste decomposing in landfills, livestock, and the production and transport of natural gases, oils and coal.

**Nitrous Oxide** naturally occurs within the atmosphere, however, increased use of nitrogen-rich fertilizers and manure to grow crops faster have significantly increased its presence. Nitrous oxide is around 300 times more potent than carbon dioxide and remains in the atmosphere for over a century. North America and Europe are utilizing methods to avoid excessive amounts of nitrous oxide.

**Fluorinated Gases** are man-made and highly potent greenhouse gases that can remain in the atmosphere for thousands of years. These gases are produced through industrial processes and are used as refrigerants.

Source:

<https://www.sciencedaily.com/releases/2019/11/191118162932.htm>

<https://www.scientificamerican.com/article/how-bad-of-a-greenhouse-gas-is-methane/><https://www.nationalgeographic.org/encyclopedia/climate-change/>

<https://davidsuzuki.org/what-you-can-do/what-is-climate-change/>

## 1.2 The Problem with Plastics

Plastics are a miracle product, they can be moulded into anything, are inexpensive, tough, generally safe to handle, keep items fresh and free of germs, and don't break down easily. However, excessive use of plastics as disposable items has led to a build-up of them within landfills and in ecosystems. They are disrupting food webs as animals may mistake plastics for food and get entangled in them. They impact our cities by flooding areas when they get caught in drainage systems and they litter our streets. Their ability to take millions of years to breakdown has now become an issue instead of an advantage as finding a way to deal with plastics becomes an increasing problem.

Source:

<https://www.livescience.com/33085-petroleum-derived-plastic-non-biodegradable.html>

## 1.3 What are Disposable Items vs Reusable Items?

Disposable items are both products and packaging that are discarded frequently after a single use. They are often made of non-biodegradable materials, like plastic, and end up in the landfill. These items are generally viewed as being a cheap and convenient solution to problems despite their long-term impacts on the environment. An example of a single-use item would be plastic water bottles. Disposable items can often be replaced with reusable substitutes.

Reusable items can be used multiple times, if not indefinitely, and help you to avoid discarding the same disposable items over and over again. There are other sustainable alternatives to reusable items such as replacing harmful materials with more beneficial ones. An example of this would be replacing plastic toothbrushes with bamboo ones.

Source:

<https://www.sustainability.vic.gov.au/You-and-your-home/Live-sustainably/Single-use-items>

[https://en.wikipedia.org/wiki/Disposable\\_product](https://en.wikipedia.org/wiki/Disposable_product)

## 1.4 What is Consumerism?

Consumerism is the idea that purchasing goods in increasing amounts benefits our economy. It promotes the concept that consuming more goods will lead to a happier and more fulfilling life. This is not true and is causing people to consume beyond basic necessity. Many people view material acquisition as a way to improve their social status and self-worth despite the negative impacts that these behaviours have on our environment.

Over-consumption leads to an increase in waste production which fills our landfills to capacity. It also contributes to climate change as items must also be manufactured and transported, both processes releasing greenhouse gases. Resources must be extracted in order to manufacture the item which removes natural habitats and is a wasteful use of our limited resources.

One of the driving forces behind our growing demand for goods is advertising. Advertising has shown us that we will be happier when we purchase a company's goods. Constantly being told to buy certain items has become a part of our daily lives and is something we must learn to overcome in order to avoid needless purchases.

Canadian's are one of the biggest over-consumers; we require 7.25 hectares of land to support our demand on resources. In comparison, the average global citizen only consumes 2.8 hectares of land. In 2020, Earth Overshoot Day fell on August 22. Earth Overshoot Day marks the date when humanity has exhausted nature's budget for the year. Thus, finding ways to cut back on our consumption through avoiding advertising and relying on material wealth is critical to our future.

Source:

<https://www.vocabulary.com/dictionary/consumerism>

<https://www.overshootday.org/>

### **1.5 What does it mean to be Waste-Free?**

Having a waste-free lifestyle does not mean removing all waste from our lives, it is impossible to avoid generating all waste. Living waste-free involves minimizing the amount of waste we create in our lives and diverting the waste that we do create away from landfills. For example, using reusable or compostable straws is a great way to say 'No' to disposable plastic straws that are destined for the landfill. In addition, there are **3 STEPS** that can be taken towards reducing waste in your life. The first step is to be aware of the disposable items you use and determine if you can find reusable substitutes for them. One example would be replacing disposable restaurant take away packaging by bringing your own containers. The second step is to consider the items you consume, figure out if you really need it or if it will just get thrown into the trash soon after you buy it so to refuse it. The third step is to plan ahead of time when you know you may encounter waste. For example, if you're going grocery shopping, remember to bring your cloth tote bags.

A waste-free lifestyle differs from taking part in recycling and composting in that it is the act of avoiding waste while recycling and composting are diverting waste away from landfills. We must be particularly responsive at this time to Covid-19 behaviours which are increasing delivery of meals to our homes as it is producing more one use throwaways instead of less.

Source:

<https://www.trea.ca/wp-content/uploads/2018/07/Edited-WRG-Final-PDF.pdf>

<https://www.trea.ca/waste-free>

### **1.6 What is Recycling?**

Recycling is the process of breaking down waste that would normally go to the landfill and turning it into a new and useful product. Products are broken down into different materials which



are why recyclables need to be sorted between papers and containers. Recyclables are generally not sorted once collected so it is important to ensure items are in the correct bin. Otherwise, the whole batch of recyclables may be sent to the landfill. Items must also be clean of food waste; otherwise, they should not be recycled. Furthermore, electronics such as phones and laptops cannot be thrown into recycling bins, there are specialized electronic drop off stations around every city where they can be safely disposed of. The City of London has also implemented a new recycling program called the Hefty® EnergyBag® Pilot Project. This project will allow for plastics previously sent to the landfill, can now be recycled such as chip bags and pet food bags.

Source:

<https://getinvolved.london.ca/HEB>

<https://london.ca/living-london/garbage-recycling>

<https://globalnews.ca/news/4153053/biggest-recycling-mistakes/>

<https://www.epa.gov/recycle/recycling-basics>

<https://www.recyclemyelectronics.ca/on/>

## 1.7 What is Composting?

About 60% of London's landfill waste is composed of organic materials; all of this waste can instead be used to make nutritious compost. Composting is the breakdown of organic matter such as food scraps into a nutrient-rich, soil-like material called compost. Organic matter is typically broken down by microorganisms such as bacteria; however, invertebrates also help with the process. Compost provides nutrients and minerals to plants and microorganisms, for a healthy soil ecosystem. It also prevents erosion and the dehydration of plants as it retains water well.

There are 2 main types of residential composting:

**Outdoor composting** is used for both kitchen and yard waste. Outdoor compost requires a specific combination of “brown” and “green” waste to support healthy soil microorganisms. “Brown” waste is carbon-rich and includes wood chips, dried leaves, while “green” waste is nitrogen-rich and includes grass clippings and food scraps. The ideal carbon to nitrogen ratio for soil organisms ranges from 15:1 to 30:1. Typically, materials such as meat and oil should not be composted since they will smell and attract pests. One disadvantage of outdoor composting is that it slows down during the winter, so it is often complemented with indoor composting.

**Indoor composting/vermicomposting** uses earthworms in an enclosed container to break down food scraps. Not just any kind of worm will do for vermicomposting, red wigglers are recommended since they remain at the surface of the soil, feeding on food scraps. Other kinds of worms tend to ignore the food and remain at the bottom of the bin. It takes about 3 to 6 months for food scraps within the bin to become usable compost. A well-maintained vermicomposting bin should not smell, and it allows for compost all year round, ideal for your flower boxes.



In 2022, the City of London will be introducing green bins so that compostable items can soon be picked up from curbside. Items will be taken to a composting facility and provide Londoners with an additional way to deal with their food scraps. The introduction of green bins is part of the City's 60% Waste Diversion Action Plan to increase the amount of waste that is diverted away from the landfill from 45% to 60%. The City has experienced some recent delays given Covid-19 but has facilitated public consultation on types of bins as well as landfill expansion to date.

Source:

<https://www.trea.ca/programs/waste-recycling/composting-101/>

<https://www.epa.gov/recycle/how-create-and-maintain-indoor-worm-composting-bin>

<https://getinvolved.London.ca/whywasteresource>

<https://getinvolved.london.ca/whywastedisposal>

<https://london.ca/living-london/garbage-recycling>

## **1.8 How does Reducing and Diverting My Waste Help to Stop Climate Change?**

A waste-free lifestyle takes action on climate change by reducing the number of disposable items we consume. This lowers the demand of single-use products, decreasing their production. The production of a disposable item consists of several steps that produce greenhouse gases.

**Resource extraction** contributes to climate change as greenhouse gases are released when materials such as oil or wood are extracted from the planet. Heavy equipment is usually involved as well which releases emissions during the extraction process.

The **transportation** of the product and its raw materials contributes to emissions as they often travel between countries until it is eventually delivered to a retail store. Once raw materials are extracted, they are transported to manufacturing facilities to create the disposable item that consumers use. Some products must be transported to multiple manufacturing facilities in order to be made. After the product is finished, it is packaged then transported to retail stores. Lastly, once the product is discarded, it will be transported to either a landfill or be recycled.

**Manufacturing** produces emissions directly through the machines and processes used to make the product. Emissions are also created indirectly through the energy needed to power the facility. Ontario is currently addressing lifecycle production putting more responsibility on the manufacturer for circular economy measures in the 'recovery' of products for continued use.

The **landfill** is where many disposable items are sent to once the consumer uses them. Landfills negatively impact the environment by contributing to groundwater pollution, soil infertility, and their construction destroys habitats. Certain kinds of waste will also release methane as they break down in the landfill. Furthermore, city landfills are reaching capacity, so they are no longer becoming a viable option to dispose of waste. London's landfill is projected to reach capacity in

the year 2024 so steps are being taken to expand it and decreasing the amount of waste from going into it. The province is making it much more difficult to establish any new landfills so cities must plan for greater waste diversion plans.

When people use reusable substitutes or use less, it's helping to avoid the detrimental effects that ongoing production of single-use items have on the environment.

Composting mitigates the impacts of climate change by diverting organic matter away from the landfill. Organic matter in landfills is broken down by microorganisms that release methane, contributing to climate change. However, the process of composting utilizes microorganisms that release little to no methane when the microorganisms break down organic material.

Recycling reduces the impacts of the extraction of natural resources. Containers and paper items can be broken down and turned into base materials instead of mining for oil or cutting down trees. Manufacturing products from recycled ones also generally requires less energy to produce a final product.

Also to understand our City's current strategy for climate change which includes waste diversion, a Climate Emergency Plan was approved in April 2020 which outlines actions to establish net-zero emissions by 2050, a major road map to our future.

Source:

<http://www.compost.org/>

<https://www.agric.wa.gov.au/climate-change/composting-avoid-methane-production>

<https://getinvolved.london.ca/climate>

<https://davidsuzuki.org/what-you-can-do/what-is-climate-change/>

<https://www.trea.ca/wp-content/uploads/2018/07/Edited-WRG-Final-PDF.pdf>

<https://gbci.org/zero-waste-forgotten-climate-change-mitigation-tactic>

## **2.0 Resources for Students and Teachers**

Thames Region Ecological Association has a website which addresses numerous environmental issues that London residents face today as well as a comprehensive Green Directory on important issues such as waste, water, transportation, energy, air quality, consumerism and local food.

- <https://www.trea.ca/>

Canada's specific website for taking action on climate change along with Canada's climate plan.

- <https://www.canada.ca/en/services/environment/weather/climatechange.html>

One of Canada's most trusted and respected environmentalists – David Suzuki's website.

- <https://davidsuzuki.org/>

A series of kits and resources to help you find ways to reduce waste in and outside of the classroom (Waste Reduction Week Canada).

- <https://wrwcanada.com/en/get-involved/resources/tool-kits/schools>

Additional resources on how you can make your classroom as waste-free as possible.

- <https://greenactioncentre.ca/reduce-your-waste/waste-reduction-week-for-schools/>

Learn about all the benefits of composting and find guides on how to carry out composting (Composting Council of Canada).

- <http://www.compost.org/>

The Pembina Institute of Canada brings holistic and practical solutions for a sustainable world, the first organization to bring Canadian environmental awareness programs to Canadians.

- <https://www.pembina.org/>

A booklet on how you can reduce solid wastes accompanied by endearing pictures. (United States Environmental Protection Agency).

- <https://nepis.epa.gov/Exe/ZyPDF.cgi/10000MD0.PDF?Dockey=10000MD0.PDF>

Learn how your students can eat lunch and save the environment at the same time. (Hamilton County Recycles).

- [http://www.hamiltoncountycycles.org/UserFiles/Servers/Server\\_3788196/File/EnvironmentalServices/SolidWaste/Schools/Reducing%20Waste/WasteFreeLunch.pdf](http://www.hamiltoncountycycles.org/UserFiles/Servers/Server_3788196/File/EnvironmentalServices/SolidWaste/Schools/Reducing%20Waste/WasteFreeLunch.pdf)

If you'd like to start a vermi-compost bin in the classroom with your students, please see this visual guide (United States Environmental Protection Agency).

- <https://www.epa.gov/recycle/how-create-and-maintain-indoor-worm-composting-bin>

For schools looking to start outdoor composting, read this guide on how to set up and maintain composting and other tips to become waste-free (Thames Region Ecological Association).

- <https://www.trea.ca/programs/waste-recycling/composting-101/>
- <https://www.trea.ca/waste-free/>

Looking for a fun and interactive way to teach your students about the environment? Introduce them to NOAA Games, a wide selection of games covering different environmental topics.

- <https://games.noaa.gov/>

Teach your students how cities recycle waste through Recycle City. An interactive site that shows the Ins and Outs of city recycling (United States Environmental Protection Agency).

- <https://www3.epa.gov/recyclecity/mainmap.htm>

Your students can learn how they can recycle better by following the Zabbaleen, the garbage collectors of Egypt who recycle up to 80% of their waste. (PBS)

- <http://www.pbs.org/independentlens/garbage-dreams/game.html>

If any of your students are soccer fans, they can learn about what the life of a soccer ball entails. (United States Environmental Protection Agency)

- [https://www.epa.gov/sites/production/files/2015-09/documents/the\\_life\\_of\\_a\\_soccer\\_ball.pdf](https://www.epa.gov/sites/production/files/2015-09/documents/the_life_of_a_soccer_ball.pdf)

Engage your students in thinking about climate change by having them write a letter to their future selves and see what hundreds of people worldwide are saying about climate change. <https://www.deartomorrow.org/>

Discuss with your students a series of UN articles on consumer impacts and climate change.

- <https://www.un.org/en/academic-impact/consumerism-and-climate-change-how-choices-you-make-can-help-mitigate-effects>

### **3.0 Ontario Curriculum**

#### **Science and Technology Topics Covered**

##### Understanding Life Systems

- (Gr. 3) Growth and Changes in Plants
- (Gr. 4) Habitats and Communities
- (Gr. 5) Human Organ Systems
- (Gr. 6) Biodiversity
- (Gr. 7) Interactions in the Environment

##### Connections to Program through Ontario Curriculum Overall Expectations:

- (Gr. 3) Assess ways in which plants have an impact on society and the environment, and ways in which human activity has an impact on plants and plant habitats.

- (Gr. 3) Demonstrate an understanding that plants grow and change and have distinct characteristics.
- (Gr. 4) Analyse the effects of human activities on habitats and communities.
- (Gr. 4) Demonstrate an understanding of habitats and communities and the relationships among the plants and animals that live in them.
- (Gr. 5) Analyse the impact of human activities and technological innovations on human health.
- (Gr. 6) Assess human impacts on biodiversity and identify ways of preserving biodiversity.
- (Gr. 6) Demonstrate an understanding of biodiversity, its contributions to the stability of natural systems, and its benefits to humans.
- (Gr. 7) Assess the impacts of human activities and technologies on the environment and evaluate ways of controlling these impacts.
- (Gr. 7) Demonstrate an understanding of interactions between and among biotic and abiotic elements in the environment.

#### Connections to Program through Ontario Curriculum Specific Expectations:

- (Gr. 3) Assess ways in which plants are important to humans and other living things, taking different points of view into consideration, and suggest ways in which humans can protect plants.
- (Gr. 3) Assess the impact of different human activities on plants, and list personal actions they can engage in to minimize harmful effects and enhance good effects.
- (Gr. 3) Identify examples of environmental conditions that may threaten plant and animal survival.
- (Gr. 4) Analyse the positive and negative impacts of human interactions with natural habitats and communities, taking different perspectives into account and evaluate ways of minimizing the negative impacts.
- (Gr. 4) Identify reasons for the depletion or extinction of a plant or animal species, evaluate the impacts on the rest of the natural community, and propose possible actions for preventing such depletions or extinctions from happening.
- (Gr. 4) Describe ways in which humans are dependent on natural habitats and communities.
- (Gr. 5) Analyse the effects of forces from natural phenomena on the natural and built environment.
- (Gr. 5) Evaluate the impact of society and the environment on structures and mechanisms, taking different perspectives into account, and suggest ways in which structures and mechanisms can be modified to best achieve social and environmental objectives.
- (Gr. 6) Analyse a local issue related to biodiversity, taking different points of view into consideration, propose action that can be taken to preserve biodiversity, and act on the proposal.
- (Gr. 6) Assess the benefits that human societies derive from biodiversity and the problems that occur when biodiversity is diminished.
- (Gr. 6) Identify everyday products that come from a diversity of organisms.
- (Gr. 7) Assess the impact of selected technologies on the environment.

- (Gr. 7) Analyse the costs and benefits of selected strategies for protecting the environment.
- (Gr. 7) Describe the roles and interactions of producers, consumers, and decomposers within an ecosystem.
- (Gr. 7) Describe how matter is cycled within the environment and explain how it promotes sustainability.
- (Gr. 7) Describe ways in which human activities and technologies alter balances and interactions in the environment.

#### Understanding Matter and Energy

- (Gr. 5) Forces Acting on Structures and Mechanisms
- (Gr. 6) Electricity and Electrical Devices
- (Gr. 7) Form and Function

#### Connections to Program through Ontario Curriculum Overall Expectations:

- (Gr. 5) Evaluate the social and environmental impacts of processes used to make everyday products.
- (Gr. 6) Evaluate the impact of the use of electricity on both the way we live and the environment.
- (Gr. 7) Analyse personal, social, economic, and environmental factors that need to be considered in designing and building structures and devices.

#### Connections to Program through Ontario Curriculum Specific Expectations:

- (Gr. 5) Evaluate the environmental impacts of processes that change one product into another product through physical or chemical changes.
- (Gr. 5) Assess the social and environmental impact of using processes that rely on chemical changes to produce consumer products, taking different perspectives into account, and make a case for maintaining the current level of use of the product or for reducing it.
- (Gr. 6) Assess opportunities for reducing electricity consumption at home or at school that could affect the use of non-renewable resources in a positive way or reduce the impact of electricity generation on the environment.
- (Gr. 7) Evaluate the importance for individuals, society, the economy, and the environment of factors that should be considered in designing and building structures and devices to meet specific needs.

#### Understanding Earth and Space Systems – (Gr. 3) Soils in the Environment

- (Gr. 5) Conservation of Energy and Resources

#### Connections to Program through Ontario Curriculum Overall Expectations:

- (Gr. 3) Investigate the composition and characteristics of different soils.

- (Gr. 3) Assess the impact of soils on society and the environment, and of society and the environment on soils.
- (Gr. 5) Analyse the immediate and long-term effects of energy and resource use on society and the environment and evaluate options for conserving energy and resources.

Connections to Program through Ontario Curriculum Specific Expectations:

- (Gr. 3) Assess the impact of soils on society and the environment and suggest ways in which humans can enhance positive effects and/or lessen or prevent harmful effects.
- (Gr. 3) Assess the impact of human action on soils and suggest ways in which humans can affect soils positively and/or lessen or prevent harmful effects on soils.
- (Gr. 3) Investigate the process of composting and explain some advantages and disadvantages of composting.

### **Geography Topics Covered**

- (Gr. 7) Physical Patterns in a Changing World.

Connections to Program through Ontario Curriculum Overall Expectations:

- (Gr. 7) Analyse some challenges and opportunities presented by the physical environment and ways in which people have responded to them.
- (Gr. 7) Use the geographic inquiry process to investigate the impact of natural events and/or human activities that change the physical environment, exploring the impact from a geographic perspective.
- (Gr. 7) Demonstrate an understanding of significant patterns in Earth's physical features and of some natural processes and human activities that create and change those features.

Connections to Program through Ontario Curriculum Specific Expectations:

- (Gr. 7) Describe various ways in which people have responded to challenges and opportunities presented by the physical environment and analyse short- and long-term effects of some of these responses.
- (Gr. 7) Compare and contrast the perspectives of some different groups on the challenges and opportunities presented by the natural environment.
- (Gr. 7) Formulate questions to guide investigations into the impact of natural events and/or human activities that change the physical environment, ensuring that their questions reflect a geographic perspective.
- (Gr. 7) Evaluate evidence and draw conclusions about the impact of natural events and/or human activities that change the physical environment.
- (Gr. 7) Communicate the results of their inquiries, using appropriate vocabulary and formats appropriate for specific audiences.
- (Gr. 7) Describe some key natural processes and human activities that create and change landforms.
- (Gr. 7) Describe some key natural processes and other factors, including human activities that create and change climate patterns.



- (Gr. 7) Describe some key natural processes and human activities that create and change natural vegetation patterns.
- (Gr. 7) Natural Resources Around the World: Use and Sustainability

Connections to Program through Ontario Curriculum Overall Expectations:

- (Gr. 7) Analyse aspects of the extraction/harvesting and use of natural resources in different regions of the world and assess ways of preserving these resources.
- (Gr. 7) Use the geographic inquiry process to investigate issues related to the impact of the extraction/harvesting and/or use of natural resources around the world from a geographic perspective.
- (Gr. 7) Demonstrate an understanding of the sources and use of different types of natural resources and of some of the effects of the extraction/harvesting and use of these resources.

Connections to Program through Ontario Curriculum Specific Expectations

- (Gr. 7) Analyse natural resource extraction/harvesting and use in some specific regions of the world, including the sustainability of these practices.
- (Gr. 7) Evaluate evidence and draw conclusions about issues related to the impact of natural resource extraction/harvesting and/or use around the world.
- (Gr. 7) Communicate the results of their inquiries using appropriate vocabulary and formats appropriate for specific audiences.
- (Gr. 7) Identify Earth's renewable, non-renewable, and flow resources, and explain their relationship to Earth's physical features.
- (Gr. 7) Describe ways in which people use the natural environment, including specific elements within it, to meet their needs and wants.
- (Gr. 7) Identify significant short- and long-term effects of natural resource extraction/harvesting and use on people and the environment.
- (Gr. 7) Describe some responses to social and/or environmental challenges arising from the use of natural resources.

#### **4.0 TREA's Classroom Waste-Free Lifestyle Presentation Agenda**

5 min. Introduction

The program begins with a simple and brief description of the presenter and TREA. This part of the presentation is to establish who we are and what we aim to teach the students about.

5 min. What is Climate Change?

This is an interactive discussion exploring what exactly climate change is and what causes it. Students will be asked to define climate change and greenhouse gases, once defined, the students will be prompted to name sources of greenhouse gases. Answers will be written on chart paper to encourage participation. The presenter will then move onto explaining the 5 greenhouse gases

involved. Next, students will be prompted to think of ways that they can personally mitigate climate change. Answers will also be written on chart paper or on a slide if a Zoom meeting.

#### 5 min. What is a Waste-Free Lifestyle?

An interactive verbal discussion of what it means to be waste-free and ways that we can reduce waste in our lives. Students will be encouraged to name disposable items in their lives and reusable substitutes to these items. Responses will be written out on a piece of chart paper to support further participation. As the discussion concludes, the students will be told the 3 steps for reducing waste in their lives and asked to share ways they can apply these steps to their lives.

#### 10 min. Take a Step Back from Consumerism Task

This exercise is focused on teaching the students about reflecting on the things they already have in their life. To start off, the presenter will showcase an ad and talk about how companies push the idea that we constantly need new items and how this is harmful to both the environment and our wellbeing. Students will be separated into 5 groups where they will each have an ad in front of them. As the conversation begins, students will be asked to relate aspects of the ad to the conversation such as what the ad is trying to sell, if the item is necessary, would it end up in a landfill, and so on. Once the discussion around the ad ends, the groups will be asked to go around in their group and tell each other something they're grateful to have in their life and why that is not something you purchase. This could be a pet, a garden, a neighbour, etc. If there is extra time after this sharing, they may share this further with the class as a whole. The reason for this is to take the focus away from what we want and instead, and look at what we have.

#### 15 min. Reusable Entrepreneurs Pitch

This exercise works best by dividing the class up into groups of 5 and each group is given a couple of sheets of paper. The students will have 5 minutes to decide upon a disposable item they use in their lives then create a reusable alternative for it that isn't yet invented. They can write down and draw out their ideas on the paper. They should think of ways that their disposable product specifically harms the environment and how their reusable product is improving the planet. The purpose of this exercise is to have students practice their innovative thinking and reflect on ways to improve wasteful behaviour in their own lives. Then each group will have 2 minutes to present their idea to the class. Their presentation should discuss the issue involving the original product, introduce their reusable version then highlight the benefits of it. Once the students are finished presenting, the class may vote on which idea they liked the most. They cannot vote on their own group. The winning group will receive a small reward. This exercise lets students learn to articulate and summarize their ideas. Overall, this module is meant to help your students understand the circular economy and think about ways that they can apply those skills to the environment. Only include this event if the presentation is to be an hour long.

#### 5 min. What is Recycling and Composting?

This exercise serves to remind students about the importance of recycling and composting in diverting waste away from landfills. The discussion will begin with recycling where students will

be asked to name the benefits of recycling and whether they recycle at home. Students will raise their hands if they recycle and the presenter will count the number of hands raised. The presenter will discuss a bit about the upcoming plastic recycling initiative in London and other aspects of what the City is delivering including its strategy to move from waste diversion of 45% to 60%.

Next, the discussion will move towards composting and how it works. Students will be asked to name organisms that help in the decomposition process. Next, the presenter will discuss outdoor composting and see whether students do this at home and if not, would they be interested. Lastly, the presenter will open the discussion to indoor vermicomposting and how it is an easy and fun way to compost year-round. Students will be asked if they vermicompost and if not, whether they'd like to. The purpose of this discussion is to engage students in waste diversion processes and to let them see what the available options are. This discussion also opens students up to thinking about what happens to recyclables and the process of decomposition.

#### 10 min. Sort your Waste Challenge

Sort your Waste Challenge requires that the class be split into 2 teams. A couple of desks will be arranged at the front of the class and have 2 unorganized piles of pictures of various disposable items on it. Each team will be responsible for working together to sort their pile into 3 provided containers that are labelled **“trash”, “recycling”, and “composting”**. Some waste items may have sticky tac on them to symbolize items that frequently go to trash in error such as food scraps, all items that are recycled or composted should have the sticky tac removed. Teams will also be provided with a list of items that go into each container, although some items in the pile will not be explicitly stated on that list. The first team to sort their items into the correct containers will win and receive a small reward. If a team guesses incorrectly, the presenter will let them know how many items are incorrect and give them a hint.

The purpose of this activity is to give students a hands-on experience with sorting waste. It is also meant to show them that there are resources available to teach them how they can properly sort their own waste. Furthermore, students will practice their ability to communicate in a team-setting, cooperate in a competitive environment, and use logical thinking. After the challenge is over, the presenter will remove any pictures of toys and clothes from the trash container and discuss how you can send them to thrift stores and give them a new home. Lastly, the presenter will remove any plastic bags from the trash container and tell the class that they can be returned to the retailer instead of being sent to the landfill.

#### 5 min. Take Home Workbook and Conclusion

This exercise begins by summarizing information that the students learn during this program. After, the presenter or teacher facilitates the session they will reference an online workbook link and explain the purpose of it and how to complete it. The workbook is meant to be a follow-up lesson for students to work on with their family or guardian. Once students determine how many points they accumulated, they can check the end of the book to see an analysis of the results. Students are expected to print off and bring their results back to class to discuss in a second session their contributions towards a waste-free lifestyle. This project can be used as an assignment with a mark for completion. The workbook is meant to allow students to

independently see ways that they can reduce waste in and around their home and to influence better decision-making to achieve waste reduction with family and friends.

**Please note a TREA online survey for children to calculate their household potential carbon footprint reductions is available. Also TREA has an activity book with different exercises for various ages to help increase their understanding and motivation for waste-free behaviour. This can be incorporated into the classroom learning session. Visit <https://www.trea.ca/waste-free/> for these tools and the family workbook discussed above.**

## **5.0 TREA Module Summary**

### **5 min. Introduction**

A brief overview of what will be covered during this presentation and the goal of TREA.

### **5 min. What is Climate Change?**

This is an interactive discussion exploring what exactly climate change is and what causes it.

### **5 min. What is a Waste-Free Lifestyle?**

An interactive verbal discussion of what it means to be waste-free and to be a Canadian consumer.

### **10 min. Take a Step Back from Consumerism Task**

This module is focused on teaching about how advertisements aim to influence us as well as to give a chance for students to reflect on what they are grateful for in life.

### **15 min. Reusable Entrepreneurs Pitch (Only if presentation is an hour or more)**

The purpose of this activity is to give students a chance to come up with a sustainable solution for a disposable item and pitch it to the class.

### **5 min. What is Recycling and Composting?**

This module serves to remind students about the importance of recycling and composting in diverting waste away from landfills.

### **10 min. Sort your Waste Challenge**

Students will be tested on their ability to sort waste into the correct bins in order to help them to remember how to do it at home.

### **5 min. Take Home Workbook and Conclusion**

A quick summary of the information that the students learned will take place and then an overview of the online take home workbook - the purpose of it, how to complete it, and to give the last page back to the teacher. As well reference to the online survey, activity book, all found at <https://www.trea.ca/waste-free/> along with the teacher's guide and other resources.

## 6.0 TREA is Here to Help

We appreciate your interest to use this material and welcome you to keep in touch.

If you have any questions, comments, or concerns, please do not hesitate to contact TREA:

In-person (call first) or by inquiry:

Grosvenor Lodge, 1017 Western Road, London, Ontario, N6G 1G5

By phone: (519) 645 2845 By email: [info@trea.ca](mailto:info@trea.ca)

Through our website: [https:// www.trea.ca/](https://www.trea.ca/)

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