



**DID YOU  
KNOW?**



# What happens to the Plastic Waste we produce?

In 2012, Canadians threw away over 3 million tonnes of plastic (1), this translates to over 90 kg of plastic waste per person in one year.

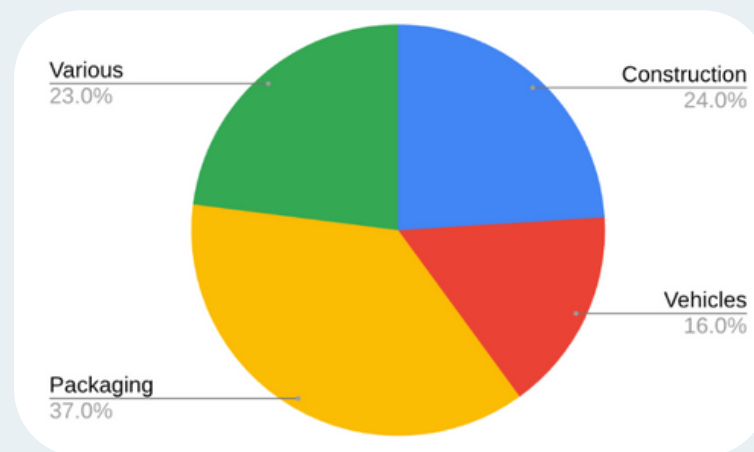
From 2012 to 2019, Canada's annual plastic waste increased by 15% to 4 million tonnes (2).

However, we only recycle 9% of our plastic waste. In addition to recycling, plastic waste is also remanufactured, repaired and reused, although the total amounts to only 30% of our plastic waste (2016 data - (2)). An estimated 2.8 million tonnes per year goes into landfill or some is directly littered into the environment. (3)

Plastics in landfills and plastics just littered into our environment can break down into smaller parts and be carried and blown away into our waterways where they often end up in the ocean. In addition, additives and other chemicals involved in making plastics can leach from landfills into our waterways and become pollutants.

Plastic waste, i.e, plastic which has not been recycled or plastic lost during transport from e.g., ships can be found littered in our environment. Much of our plastic waste ends up in the ocean, where it can form large garbage patches. Many ocean species can be draped in plastic waste or confuse it as food, for example sea lions and seals have been found caught in packing bands for boxes and abandoned fishing nets, sea turtles can confuse plastic bags as jellyfish, one of their foods, and birds are known to eat plastics of various sizes. Sunlight will break plastic into small parts (such as Microplastics), which can then be consumed by various species such as whale sharks, whales and other filter feeders.

The following pie chart shows the percentage of plastics made for consumption in Canada in 2019. Various stands for electrical and electronic equipment, textiles, agricultural film and other miscellaneous items.



Plastics made for packaging present a significant fraction. Furthermore: "Of all plastic in products permanently disposed of in Canada, packaging with shorter lifespans comprised almost half (49%) in 2019." (4)

The Canadian government has launched initiatives to reduce plastic waste, but your help is essential to make a real impact<sup>2</sup>.

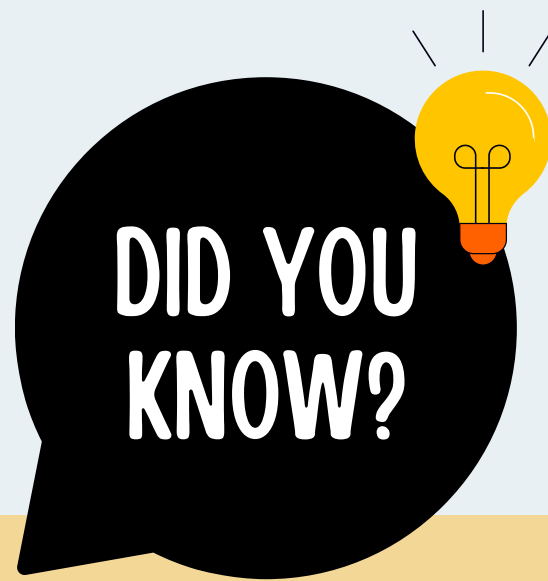
The best way of reducing our plastic waste is to practice the plastic Rs, preferably in the following order: 1. Refuse, 2. Reduce; 3. Reuse; 4. Repair, 5. Repurpose; 6. Recycle.

(1) <https://www.canada.ca/en/environment-climate-change/services/managing-reducing-waste/reduce-plastic-waste.html>

(2) [https://www.oag-bvg.gc.ca/internet/English/parl\\_cesd\\_202404\\_03\\_e\\_44470.html](https://www.oag-bvg.gc.ca/internet/English/parl_cesd_202404_03_e_44470.html)

(3) <https://gazette.gc.ca/rp-pr/p1/2021/2021-12-25/html/reg2-eng.html>

(4) <https://www150.statcan.gc.ca/n1/daily-quotidien/230309/dq230309e-eng>



# Not every plastic item can be recycled

Canada's guidelines are changing and Canada is working with companies to make at least their packaging recyclable by 2030.<sup>5</sup> The rules for labelling of plastic packaging and certain single use plastics will also change.<sup>5</sup> In the past, and sometimes even now, you may have seen a number imprinted into the recycling symbol. The number varied from 1-7 plus others and served as a materials identifier. It did not indicate that the material is recyclable.<sup>6</sup>

Below is a list of some plastics we can find in our daily lives:

## **Polyethylene terephthalate (PET)**

PET is a very common plastic and is often used as a single-use container for e.g., bottles for drinks and cooking oils as well as food trays. PET can be recycled and made into items as fibres for synthetic items as clothes, bags and carpets and PET bottles.

## **High density polyethylene (HDPE)**

HDPE is found as jugs, bags and shampoo bottles. HDPE is one of the easiest plastics to recycle.

## **Low density polyethylene (LDPE)**

LDPE, a soft and flexible plastic, is used to make items as shopping and frozen food bags, squeezable bottles and shrink wrap. LDPE can be recycled only once into single use items as furniture, garbage bag liners, trash bins and shipping envelopes.

## **Polypropylene (PP)**

PP is turned into many consumer items, as bottle caps, straws and medicine bottles, of which only 1% are recycled. The recycling of PP needs many steps.

Other examples of plastics in our lives are **Polyvinyl chloride (PVC)**, **Polystyrene (PS)**, **Polyacrylate** and **Nylon**. The recycling of **PVC**, which can be found in items such as tubing and pipes requires specific processes.<sup>7</sup>

**PS**, which can be found in packaging, single-use hot drink cups and insulation materials, is difficult to recycle because it is 98% air. PS falls apart easily into small pieces and becomes a large polluter. You can bring **clean styrofoam** to **StyroRail inc. in Wakefield** for recycling.

Both **Polyacrylate** and **Nylon** are recyclable polymers, although depending on the application recycling may not be possible. For example, Polyacrylate is a very versatile polymer and added to e.g., cosmetics, personal hygiene and also food items.

(5) <https://www.canada.ca/en/environment-climate-change/services/canadian-environmental-protection-act-registry/recycled-content-labelling-rules-plastics.html>

(6) <https://methodrecycling.com/world/journal/recycling-101-what-do-the-plastic-codes-mean>

(7) <https://www.front-materials.com/news/can-pvc-be-recycled>



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## The lifetime of Plastics?

Plastics have become an integral part of our lives. They offer many advantages and have become essential in some industries. Plastics are light, durable, can be formed into many shapes, they are cheap to make and are long-lasting. However, the long lasting property of plastics also presents a burden for us and our environment as the “decomposition” of plastics can take between 20-500 years. (8)

**Table 1: Estimated “decomposition” timelines of various plastic products (9)**

Material	Estimated “decomposition” time
Cigarette butts	5 years
Plastic bags	20 years
Plastic lined coffee cups	30 years*
Plastic straws	200 years
Plastic Soda ring cans	400 years
Plastic bottles	450 years
<u>Tooth brushes</u>	500 years
Disposable diapers	500 years
Styrofoam	500 years
Fishing line	600 years

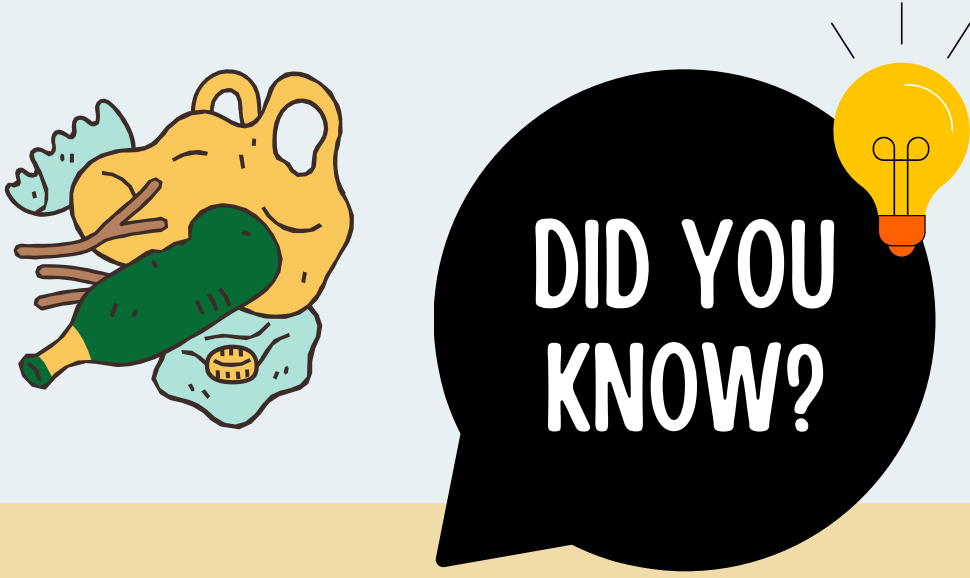
\* This timeline is strongly dependent on the type of plastic.

Materials made from natural sources decompose. However, plastics are synthetic materials and typically break apart into smaller plastic parts defined as Macro-, Micro- and Nanoplastics. Macroplastics are plastic debris larger than 5 mm in size, while Micro- and Nanoplastics are tiny plastic particles of less than 5 mm and 1 µm dimensions, respectively. Biobased plastics have emerged as alternatives to synthetic plastics made from fossil fuels. Biobased plastics are made partially or completely from natural source materials such as corn and sugarcane. Biobased plastics are a broad category and not all biobased plastics are biodegradable or compostable. (10)

(8) <https://www.un.org/en/exhibits/exhibit/in-images-plastic-forever>

(9) <https://chariotenergy.com/blog/how-long-until-plastic-decomposes/>

(10) [https://environment.ec.europa.eu/topics/plastics/biobased-biodegradable-and-compostable-plastics\\_en](https://environment.ec.europa.eu/topics/plastics/biobased-biodegradable-and-compostable-plastics_en)



## If plastics affect us?

Plastics can enter our bodies in various ways, including through food and drink, and via the air we breathe. Nano- or Microplastics can result from environmental contamination when foods are grown, harvested, transported and packaged. They have been found in a range of food groups and beverages, including sea salt and bottled water. Synthetic clothes can also release Microplastics during the wearing, washing and drying process. Plastics (Micro- and Macro) are known to be harmful to animals and fish and the possible impact on humans will have to be established. (11)

An established health concern are plastic additives that can leach from plastic containers we are using to store food and drink. Bisphenol A (BPA), an additive to make clear and hard plastics has been banned in Canada for specific products such as containers and bottles used for feeding babies. (13) Phthalates, another example of an additive of concern, makes plastics soft and flexible. Canada has not entirely banned the use of phthalates in plastics, but strongly regulates it. (14)

Plastics are used in food manufacturing equipment. For plant milk, here's one recipe and a great hand powered machine: <https://www.veganmilker.com/en/>

- 1/2 cup hemp hearts or rolled oats, soak 10 min in warm water
- 2 heaping tbsp sunflower lecithin (optional, emulsifier)
- 2-3 T maple syrup, honey or stevia
- a pinch of salt
- ¼ t cinnamon (optional)
- ¼ peel of lemon grated (optional, great flavour)
- add ¾-1L of water, blend and strain

(11) <https://www.canada.ca/en/health-canada/services/chemical-substances/fact-sheets/chemicals-glance/plastic-pollution.html>

(12) <https://www.canada.ca/en/environment-climate-change/services/evaluating-existing-substances/science-assessment-plastic-pollution.html>

(13) <https://www.canada.ca/en/health-canada/services/home-garden-safety/bisphenol-bpa.html>

(14) <https://www.canada.ca/en/health-canada/services/chemicals-product-safety/phthalates.html>