Biodegradable service-ware: Is it compostable?

Make sure biodegradable products get turned into soil! Research their true impact!

This factsheet is linked to a student worksheet and provides answers and background information to some of the questions on the student worksheet.

1. Ensure biodegradable service-ware gets properly composted

If the service-ware does not get to the proper facility to be composted it ends up in landfill, or even worse, these products end up contaminating recycling systems (see "*Double Trouble*" below for more information).

MYTH: Biodegradable products simply break down in the landfill.
FACT: Barely anything biodegrades in a landfill because materials need light and oxygen to degrade which is usually absent from well-managed municipal landfills!

Double Trouble – biodegradables can make a mess in recycling & composting systems!!

RECYCLING TROUBLE: If a recycling facility receives biodegradable products in their recycling stream, in most cases the sorters have no way of distinguishing biodegradable materials from plastic materials. This means that both items are processed through the facility which results in lower quality of plastic being produced which is more difficult to process into recycled products!
COMPOSTING TROUBLE: If a composting facility cannot process biodegradable products then the materials that are placed in the green/compost bin may cause the entire load to be rejected and go to landfill. Because well-managed municipal landfills do not provide light or oxygen, the contents of the green/compost bin simply take up space in the landfill—they do not biodegrade.

2. Defining biodegradable

Biodegradable is… an item capable of being broken down especially into innocuous products by the action of living things (as microorganisms).[1]

- "Biodegradable" is an all-encompassing term used to describe *any* product that *eventually* breaks down. This includes plastic bags which take 700 years to break down! Products that fall into this category can be marketed as biodegradable, compostable, photodegradable, and oxo-degradable.
- "Compostable" means all the materials in the product or package will break down into, or otherwise become part of, usable compost (e.g., soil-conditioning material, mulch).[2]

Composting and biodegradation are not identical, but industry uses the terms interchangeably. Be careful- not all biodegradable products are compostable and some require a specific environment to biodegrade not found in composting facilities! For example, The Region of Halton accepts paper plates and cups, and wood cutlery in their GreenCart (organics program), but their facility cannot process biodegradable/compostable plastic plates, bowls, cups, lids and cutlery.

[1] *www.merriam-webster.com/dictionary/biodegradable*

[2] *www.astm.org/Standards/D6400.htm*

Review the Facts

- Plastics can be produced from natural or synthetic materials. Traditional plastics are typically made from petroleum based products.
- **Biodegradable/compostable plastics** are produced from natural materials: starches (e.g., starch from corn, potato, tapioca, rice, wheat), oils (e.g., from palm seed, linseed, soy bean), or fermentation products (e.g. PLA, PHA, and PHB).
- The three essential components of compostibility are:
    1. that the material is used as a **food or energy source for microbes and**
    2. that a certain **time period** is necessary for the complete biodegradation and
    3. that the material is **completely consumed** in the environment
- **Compostable plastics** as defined by the ASTM D6400 standard (see ASTM info below) as "materials that undergo degradation by biological processes during composting to yield carbon dioxide, water, inorganic compounds, and biomass at a rate consistent with other known compostable materials and leave no visible, distinguishable or toxic residue."[3]

3. Types of biodegradable products

There are a number of common biodegradable products on the market these days, but they have quite different compostability rates. Here are a few definitions to get you started.[4]

Poly-lactic acid (PLA) – common HBP product

- PLA is the most common HBP and is produced from the polymerization of lactic acid. PLA can be clear/transparent and is often used to package food.
- PLA is a bio-based plastic made from corn and needs water to degrade (hydrolysis).
- Lactic acid is produced and eaten by microbes obtained from the fermentation of the plastic.

Polyhydroalkanoates (PHA) – HBP product

- PHA is produced from a fermentation of sugar feedstocks by microorganisms.

Oxo-degradable plastics – OBP product

- The oxodegradble plastics can leave small plastic fragments as residue after oxidation.
- The small plastic fragments can cause serious environmental consequences as fragments of toxic polyethylene will be left in the soil after the starch biodegrades.

ASTM standards explained

American Society for Testing and Materials (ASTM) has created standards ASTM D6400 that test for compostability. This requires that products that are compostable in a municipal and industrial composting facility at the same time not degrading the quality of the compost created.[5]

4. Considering options

All or nothing Sometimes the best way forward is an "all or nothing" scenario. Either your school decides to go **all** compostable service-ware, or none. If your school chooses the **all** compostable option, then you must find a

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[3] *www.astm.org/Standards/D6400.htm*

[4] *http://en.wikipedia.org/wiki/Biodegradation*

[5] *www.astm.org/Standards/D6400.htm*

service provider who will accept the compostable products. Here is a tool that can help you find a service provider near you: http://www.findacomposter.com/

Re-Use and Reduce A more sustainable way to reduce waste created by single-use service-ware products is to eliminate them!

- Organize your EcoTeam and school to get reusable china for your cafeteria.
- Gather a class set of reusable service-ware for class parties, club celebrations, etc. Let teachers know they can 'sign out' the class set for their events.
- Encourage students to bring their own reusable service-ware to use at your cafeteria (plastic containers, plates, cutlery, bowls).
- Ask parents and visitors to the school to 'Lug-a-mug' to school events such as curriculum night, sports events, holiday gatherings, fundraisers, etc.
- Waste free food: commit to buy food that has its own packaging (bananas, oranges, watermelon…).