Mini Life Cycle Assessments

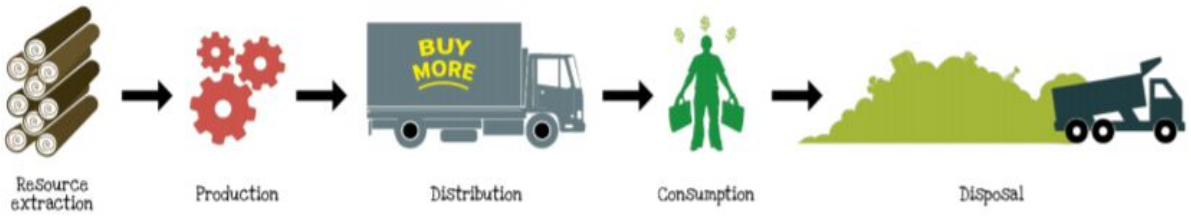
Watch this video first: https://youtu.be/DZXQI9jR0xA

We have learned about building materials, and what makes them good choices for the environment and buildings. We will take a look at everyday objects to get a better understanding of life cycle assessments (LCA). According to the World Bank, two billion tonnes of solid waste is generated yearly, the weight of about 17033 CN Towers.

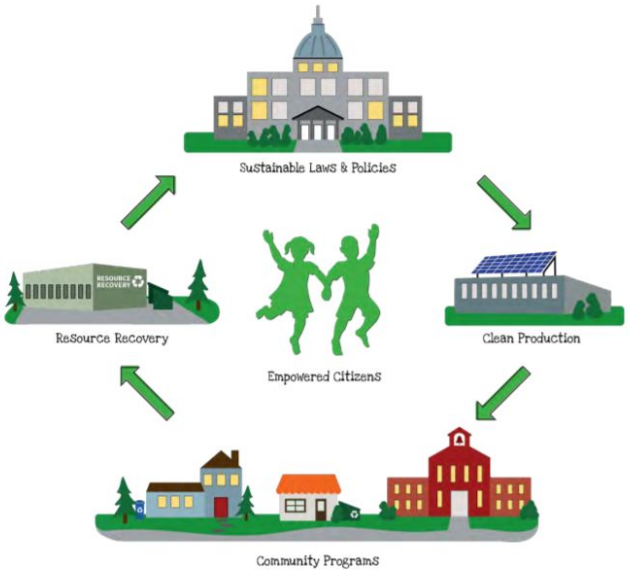
You might also wonder how we should utilize the waste, or the environmental impacts associated with the waste before and after. The LCA describes the process. The activity on the next page will give you a better understanding of the cycle and its importance. We will be looking at one object together, paper and one object of your choosing.

<u>To give some inspiration, consider the two different approaches:</u>

The traditional production/consumption cycle:



The zero-waste production/consumption cycle:



Take the idea of a piece of paper and imagine its life in a traditional production/consumption cycle:

Below, for each step of a traditional cycle, write about the process, materials or machines needed to complete each part of the life of paper (eg. paper mills and/or energy). Then, write the waste that comes from each task (eg. water and/or greenhouse gases) and its machines, or how materials are collected.

1. **Resource Extraction**

   Process, materials, energy, or machines:

   Waste:

2. **Production**

   Process, materials, energy, or machines:

   Waste:

3. **Distribution**

   Process, materials, energy, or machines:

   Waste:

4. **Consumption**

   Process, materials, energy, or machines:

   Waste:

5. **Disposal**

   Process, materials, energy, or machines:

   Waste:

Choose another object, and do the activity again. Object: _____

1. **Resource Extraction**

   Process, materials, energy, or machines:

   Waste:

2. **Production**

   Process, materials, energy, or machines:

   Waste:

3. **Distribution**

   Process, materials, energy, or machines:

   Waste:

4. **Consumption**

   Process, materials, energy, or machines:

   Waste:

5. **Disposal**

   Process, materials, energy, or machines:

   Waste:

Feel free to do more objects. It is important to think about the lifecycle of an object, especially when deciding whether to purchase them.

Activity Questions

Of the objects you looked at, which one is best for the environment? How did you choose? Do the products usually use the traditional cycle or a zero waste cycle?

The activity above looked at a traditional cycle. Now, start thinking about what it would take to make a zero-waste production/consumption cycle for your objects. How can you use the waste outputs from each of those as a useful input to a new product?

The Tradeoffs of Waste Management

The activity above only asks you to think of a traditional cycle. As shown in the two cycle types above, there are many different paths a single object can take, like going straight to the landfills, or to companies that recycle it. These paths need to be considered when creating new objects, in order to lessen the amount of waste. According to the World Bank, when looking forward, global waste is expected to grow to 3.40 billion tonnes by 2050, more than double population growth over the same period, and this waste takes up important space, in oceans and in landfills.

Recycling has become a sustainability focus, but along the way, recycling uses energy to return products to their original state (eg. through transporting and recycling plants), thus often creating greenhouse gases, while the material quality may decrease with different impurities and contamination being introduced. With more complex products, like cellphones and other technology, recycling becomes even more difficult, requiring even more machinery to melt down and separate different metals, so they can be used to create other products. Again, this uses a lot of energy, and, possibly repairing or reselling products could be a more sustainable way of managing electronic waste. All this energy used for recycling can sometimes outweigh the energy it takes to make the product in the first place!

Reducing use and designing products for the entirety of its life cycle is truly important to making more sustainable products, like making certain pieces come apart easily or designing them to be biodegradable.

What can I do?

Small actions cause huge impacts, and there are many ways you can participate, such as the 5Rs: Refuse, Reduce, Reuse, Recycle, Reflect. Here are some examples:

Refuse: say no to single-use utensils

Reduce: reduce use of paper cups by using water bottle

Reuse: reuse shopping bag

Reflect: how do we consume consciously? Be mindful of the impact on nature, and about the damage we might cause

Recycle: put items (paper, cardboard) in recycling bins (individual)

Sources:

World Bank Waste Data http://datatopics.worldbank.org/what-a-waste/
5Rs: https://www.behance.net/gallery/66844281/Earth-Day-5Rs
Other Images:https://learninglab.usgbc.org/module/1037/994