

# Recycling

## Refuse, Reduce, Reuse, Recycle

For hundreds and thousands of years cultures have been recycling and reusing primarily due to the time, money and resources that went into making products. These early groups would use what their environment provided for them. When something had lost the usefulness of its original purpose, humans innovated and morphed their use of the objects to match what they needed. Early humans did this with weaponry as it became dull. The more worn a weapon got they would reevaluate the use of it and reshape it to fit another need. An ax head would become a knife blade, knife blade becoming a kitchen item, and so on.

This happened until an object came to the point of no return and was deposited into a *midden* or a trash dump. These “middens” or archaeological trash dumps have been found all over the world and include the remains of animals, broken pieces of tools, broken pottery and other refuse. This reaction to reuse was a part of life, it was ingrained in culture. In fact, this was an instinctual reaction for most of humanity up until the industrial age.

### Timeline:

**Polystyrene: 1839-** Eduard Simon an apothecary discovered polystyrene, which after working with Hermann Staudinger was realized to be plastic polymer and similar to rubber in its makeup.

**Creation of Plastic from Celluloid: 1868-** John Wesley Hyatt created a substitute for ivory made from cellulose. This substitute was one of the first examples of what we today call plastic. It was used for pool balls, records, and also film for video production.

**Creation of PVC: 1872-** Eugen Baumann a German chemist created PVC in 1872. This material would not become patented until 1913 when Friedrich Klatte applied this product.

**Creation of Cellophane: 1908-** Jacques E. Brandenberger, a swiss chemist, discovered cellophane, a material that went on to help produce things like gas masks for the world war.

**Bakelite was invented: 1909-** Leo Hendrik Baekeland often referred to as the father of the plastics industry, invented a plastic substance from Phenol-Formaldehyde.

**Plasticized PVC: 1926-** Walter Semon went on to plasticize the PVC product produced earlier, to create a product that would become widely accepted.

**Saran (Polyvinylidene): 1933-** Accidentally discovered by Ralph Wiley who was a glass cleaner at DOW chemicals. He came across a substance that he could not clean and this was tested and eventually became the earliest form of saran.

**Polystyrene made practical: 1938-** Dow chemical professionals teamed up to create a more effective, low cost form of this polystyrene.

**Teflon (Polytetrafluoroethylene) created: 1938-** Roy Plunkett made an accidental discovery in the lab of the slippery substance that we know today as Teflon.

**WWII Begins: 1939-** Salvage campaigns are championed throughout Germany, US, and other countries active during the second world war. An emphasis in American society is made on how stateside Americans can help the cause of the war by saving metals, rubber, grease, etc and donating it to be used in the war.

**Nylon and Neoprene: 1939-** Wallace Hume Carothers invents a substitute aimed at replacing women's hosiery. This product goes on to revolutionize the clothing opportunities in fashion.

**Polyethylene Terephthalate (PET): 1941-** Whinfield and Dickson two researchers created a reaction that led to an early form of PET plastic.

**Low-Density Polyethylene: 1942-** This form of plastic began heavy production in 1941-1942. The plastic was not preferred because of its inability to withstand higher temperatures.

**Unsaturated Polyester (PET): 1942-** John Rex Whinfield and James Tennant Dickson create an unsaturated form of the PET polymer that will eventually lead to the fabric we know of as polyester.

**WWII Ends: 1945-** The end of the second world war brought the frugality of war time efforts to an end. Gradually more plastic and disposable items came into the mainstream.

**Fresh Kills Landfill Opens: 1947-** Staten Island opens what was intended to be a temporary landfill. Within ten years Fresh Kills was the largest landfill in the world.

**High Density Polyethylene (HDPE) and Polypropylene: 1951-** Paul Hogan and Robert Banks created a thicker more dense version of the original Polyethylene substance. This would later be used to make toys such as the hula hoop.

**Saran Wrap: 1953-** Dow Chemicals released Saran wrap for use in groceries and markets.

**Keep America Beautiful is formed: 1953-** An organization comprised of industry representatives is formed. The organization's focus is on the individual use of consumers and how they take responsibility for their actions through responsible disposal of their waste, picking up litter, recycling, etc.

**Styrofoam: 1954-** Ray McIntire from Dow Chemical introduces Polystyrene or styrofoam products to the United States.

**“Throwaway Living”:** 1956- Life Magazine publishes an article highlighting and encouraging Americans to purchase “disposable” meals, cookware, cleaning products, etc. The article proposed that these new products would save housewives time and energy.

**First Earth Week: April 16th-22nd 1970-** Philadelphia PA hosted the first earth week, eventually leading to the creation of Earth Day. This week sparked ideas of how to reverse Global pollution, littering, and ultimately a movement of respect and admiration towards the environment.

**Thermoplastic Polyester:** 1970- TBrought into common use in1970, this advancement brought about the ability of protecting water pipes and other materials that would easily corrode.

**Linear Low-Density Polyethylene:** 1978- Created in 1978, this form of polymer is used in products that we use commonly today such as plastic bags, flexible tubing, piping, and many other useful items we enjoy today.

**Curbside Recycling:** 1980- In December of 1980 Woodbury NJ mayor Donald P. Sanderson mandated curbside recycling. This was the first mandatory recycling effort made in the United States.

**Mobro 4,000:** 1987- A garbage barge carrying 3,168 ton of garbage left New York in search of a place to dispose of the waste. Upon arrival in North Carolina the barge was turned away out of fear that it contained hazardous materials. The voyage of this barge continued for several months until finally docking back in New York where the garbage would then be incinerated.

**Corporate Responsibility:** 1991- Germany issued a packaging ordinance in 1991 that charged manufacturers and producers of products with the responsibility of reusing or recycling the material once the user was finished with the product. This made the companies producing these products pay more attention to the types of packaging they were using.

**Single Stream Recycling:** 1995- Starting in California, the United states put into effect a new recycling system in which all items (glass, metal, paper, and plastics) were placed in the same container and were sorted in MRF (Material recovery Facilities) throughout the United States.

**Great American Cleanup:** 1999- Keep America Beautiful begins campaign to get citizens picking up litter and trash in the community.

**San Francisco Standards:** 2002- San Francisco set a new standard and goal for their community to recycle and compost 75% of all their waste by 2010.

**Seattle Adopts mandatory Recycling:** 2006- Seattle makes recycling and sorting through trash to find recyclables mandatory for citizens.

## **How to Recycle.**

1. **Refuse or reduce** the use of objects that are given for convenience sake. Think about what your use of a product will mean in the end for the packaging and product itself. The message “throw away” is used often in reference to the things we use, however there is no “away”. The Packaging that you are disposing of goes somewhere
2. **Reuse** products that you buy. Try to buy and use products that have repetitive value. Things that can be filled, refilled, over and over again. Doing this will take out the packaging of things that can be replaced with more permanent items, (Eg. Plastic water bottles for a canteen water bottle). Repurpose old furniture and items that would otherwise have been disposed of.
3. **Recycle or Compost** materials that you are left with. In our current society it is extremely difficult to live with zero-waste, however this last step of recycling products correctly and composting food waste made within your home is a good way to begin a transition. It is important to remember that within plastic recycling, that each time a plastic is recycled its form is disturbed and it is more difficult to transition back into the state that you purchased it in. This means that often plastic bottles will become polyester shirts or weaker forms of plastic. For recycling plastics, the current system that we have in place is a numbered system placed on the bottom or side of every plastic item we use. 1-7 is the RIC (resin identification code) used, 1 and 2 being the most commonly used and recycled forms of plastic. The 1 on the RIC is the PET (Polyethylene terephthalate) plastic which is followed by HDPE (High-density polyethylene) products which are labeled 2 on the RIC.