

Plastics friend or foe essay



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In the modern age, the use of plastics has caused a heated discussion amongst many parties. Politicians, environmentalists, the media, corporations, the general public etc. have argued for and against the use of plastics. This assignment will look into the importance of plastics in our society and the damage that it causes.

The first type of plastic manufactured for people to use was created in 1863 by an inventor called John Hyatt, but it wasn't until the 1930s did scientists gain a better understanding of developing plastics through crude oil, gas and other natural hydrocarbons. Technologies further improved during WW2 and the 1950s which drove the development of most plastics we see today.

Nowadays, plastics play an incredibly important part of our lives. The majority of the things we own or use will consist of plastic. The two biggest reasons for its popularity are its usefulness and economic value. Plastic is a material that can provide consumers with their needs and wants. It has the unique capability to be manufactured to meet very specific functional needs for consumers. Listed are some key features that make plastic the material of choice for most producers.

One of the biggest assets of plastic is that it can be manufactured to use in almost any shape or form. It can be shaped using heat and once cooled, it will remain in shape. So manufacturers can design any shape they want of their product if they use plastic. An example will be plastic bottles or toys. It can also be made to be flexible like rubber and can be made into a silk-like fibre like nylon. Plastic is also a great material for insulating heat and electricity and is very safe and non-toxic in normal situations. There are so

many types of materials that are plastic and so many functions that would be too long to list. Suffice to say that a plastic material can be manufactured to use in almost any situation.

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Plastic is an incredibly versatile material, but the process of manufacturing plastic is quite simple. Chemically, plastic is made by the bonding of a long chain of atoms. Different types of plastic are created by the different types of bonding from these atoms. For example, PVC has side chains incorporating chlorine atoms, which form strong bonds.

This makes PVC a material which is strong, stiff, heat and weather resistant. Nylon is made of repeating units linked by peptide bonds. Although the initial experiment to create these materials was costly, repeating the process is relatively simple. Also most of the chemical compounds can be obtained through hydrocarbons like crude oil, coal and even air. Previously the materials used to make certain products would have used organic materials like wood for chairs, silk for clothes, ivory for instruments etc. But now it is much easier to make products using plastic.

In the majority of cases, plastic not only replace the materials previously used, but also performs much better. Here's a fact:

“ Plastic lumber, made with recycled plastic, holds nails and screws better than wood, is virtually maintenance free and lasts for 50 years!” (1)

Although plastic is not as strong as metal, it can resist corrosion, its more durable, lasts longer and operates more efficiently. This is why it is preferred

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over metal in major appliances like refrigerators and dishwashers. Plastic bottles and cups are also safer to use than glass ones because it is shatter resistant. But there are areas which plastic can perform which other raw materials cannot replicate. Modern packaging such as heat-sealed plastic pouches and wraps helps keep food fresh and free of contamination. There would be no other viable material that can do a similar job and the existence of plastic created the packaging industry. So simply put, the performance of plastic has made our lives easier, healthier and safer

Even though plastic can be made to be hard and durable, it is incredibly lightweight compared to metal or wood. Engineers who design planes will try to construct them with as much plastic as possible to improve the aerodynamics. Its weight is also one of the many reasons why most household equipment is made from plastic as it is very convenient. Also scientists are constantly trying to reduce the weight of plastic:

“ Since 1977, the 2-liter plastic soft drink bottle has gone from weighing 68 grams to just 51 grams today, representing a 25 percent reduction per bottle. That saves more than 206 million pounds of packaging each year.”

(1)

These factors make plastic the material of choice, making it a cost effective and efficient way to providing products and services. So it is expected for businesses to use plastic, as it would make them much more competitive. It is both this economic value of plastic as well as its usefulness which is the driving force of plastic use in almost every corner of our society. Businesses are able to develop new products, create new markets and improve their

existing markets. The food industry and industries associated with them like the supermarkets is one of the biggest winners of the usage of plastic. The ability to package products means that they can keep their produce fresh and can move across huge distances.

So plastic has helped us by being a useful material and has had a positive affect in the economy. But plastic has also helped our society improve so much technologically in the 20th century. The electronics industry and its advances made is a perfect example. The most important part of the personal computer is obviously the electrical parts inside, but everything from the mouse to the keyboard, from the case to the monitor is normally made with plastic.

Designing the look and feel of a PC and its accessories is easy with plastic, as well as being a good insulator of heat and electricity. The success of the PC has helped revolutionise the computer hardware and software industry and led to other industries being developed and technological advances like fibre optics, laser printing, the internet etc. Also, with plastic we are able to design refrigerators, televisions, telephones and other electrical equipment like they are now and it's one of the reasons why they work so well.

Notably, plastics have environmental benefits as well. Plastic can help to conserve energy in your home. Vinyl siding and windows help cut energy consumption and lower the heating and cooling bills. Not only do plastic bags require less total energy to produce than paper bags, they conserve fuel in shipping. Packaging is also made more efficient, which ultimately conserves resources.

“ For every seven trucks needed to deliver paper grocery bags to the store - only one truck is needed to carry the same number of plastic grocery bags!”

(1)

So plastic has benefited our society on a huge scale, but it all comes at a price. The biggest of them all is the environmental concern. The majority of plastics used today are non-biodegradable and we use this type of plastic at an incredible scale. It is reported that:

“ The world’s annual consumption of plastic materials is nearly 100 million tonnes. In the UK, a total of approximately 4. 7 million tonnes of plastic products were used in various economic sectors in 2001.” (2)

What’s more, plastic consumption is growing at about 4% every year and we only recycle about 7% of total plastic waste used. So to dispose of plastic waste, the majority of it is put into landfill sites. As they take a long time to break down, possibly up to hundreds of years, the landfill space required by plastics waste is a growing concern. A small percentage of the waste can be incinerated, but burning plastic produces toxic fumes which can harm the environment. Plastic litter is also a major concern. Not only is it an eyesore, but it can actually be a threat to wildlife. It is reported that nearly 57% of litter found on beaches in 2003 was plastic.

Here is another problem:

“ Plastics production also involves the use of potentially harmful chemicals, which are added as stabilisers or colorants. Many of these have not undergone environmental risk assessment and their impact on human health

and the environment is currently uncertain. An example of this is phthalates, which are used in the manufacture of PVC. PVC has in the past been used in toys for young children and there has been concern that phthalates may be released when these toys are sucked (come into contact with saliva). Risk assessments of the effects of phthalates on the environment are currently being carried out.” (2)

Finally, the way we need plastic for use in our everyday lives underlines our dependency on fossil fuels, more importantly, our dependence on oil. Plastics production requires significant quantities of fossil fuels, both as a raw material and to deliver energy for the manufacturing process. It is estimated that 4% of the world’s annual oil production is used as the material to extract chemicals compounds for plastics production and an additional 3-4% to manufacture it.

So to conclude, plastic is a friend to man, but a foe to our planet. But currently we are so dependent on plastic that there is currently no way for us to stop using it. The article in (4) shows the difficulty in being plastic-free just in shopping.

But the article also shows the benefits of conversation, which I believe is the best way to deal with the problem in the short term. In Northern Ireland some supermarket chains like Marks and Spencer’s are adopting a pay as you use policy in plastic bags to encourage consumers of using less. Also almost every large supermarket chain like Tesco promotes the idea of a “bag for life” so that they can continually use the same bag over and over again to prevent wasting plastic bags. I feel this is a good step to take

because consumers need to learn how to use less, waste less and use less energy. But we need to adopt similar approaches to other areas as well as packaging.

Some countries have adopted a system of taxing businesses using plastics which has reduced its usage. In Ireland for example, businesses have managed to reduce the use of plastic bags by 90% which can be said as a resounding success. It would help improve the landfill problem considering an estimated 56% of all plastics waste is used packaging. But this creates a big problem as we are just replacing plastics with a substitute which is harder, less cost effective, and more energy consuming to produce. The study comparing plastic bag use to paper ones by Franklin Associates in (3) is an example.

As for recycling, it is a mixed bag. The advantage is that we are re-using material so we won't need to extract more raw materials to make plastic. It also solves the landfill problem. Some reports also state that recycling reduces energy usage. But most reports tend to agree that the process of recycling expends a lot of energy. In the modern world where the only environmental issue greater than plastics is the threat of global warming, I feel that recycling is a solution that creates a bigger problem.

Hopefully in the long term we can develop a material to replace plastic that would be energy efficient and is not as harmful to the environment. The biggest problem we face currently with plastic is obviously the waste, but we also need to break our dependence on fossil fuels.