

# **Sneakers Running our Environment into the Ground**

The harmful manufacturing and disposal of sneakers turned into an environmentally-friendly recycled surface.

Tag Words: Sneakers; Recycled; Disposal; Chemicals; Incineration; Playgrounds

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## **Summary**

Sneakers are manufactured with harmful chemicals that are released into the environment. They are also disposed of in harmful ways, such as incineration or dumping them in landfills, which exposes our environment to these toxic chemicals. For a cleaner and safer environment, recycling sneakers is a necessary option. Recycled sneakers can be used to produce athletic surfaces and playgrounds, which would also cut down the amount of harmful chemicals destroying our environment.

## **The Issue: The manufacturing process and disposal of sneakers is harming our environment.**

Used sneakers are usually thrown away in the trash just like any other piece of garbage. However, the materials that sneakers are made of contain toxic chemicals that pollute the environment and cause health problems. Therefore, it is unsafe to dispose of sneakers in landfills.

Most people do not consider what chemicals go into the sneakers that they purchase, but instead look at its aesthetics and pertinence to their training. They overlook the harm that sneakers could cause the environment and do not seek out environmentally friendly shoes such as those with “recycled components.” Therefore, it is imperative that people adopt the habit of recycling their used sneakers. Sneakers must be disposed of in an environmentally friendly manner because the chemicals in shoes are harmful to the environment and all living things.

There are three main parts of a sneaker: the leather upper, the elastic midsole, and an abrasion-resistant sole. Different chemicals are needed to produce different parts of the sneaker. Titanium oxide gives a sneaker its bright white color and dyes on the logo are made with heavy metals (Williams). Most shoelaces are constructed with non-recycled polyester, even though polyester laces can be recycled and reused to make more shoelaces (Williams). Polyurethane, which makes the spongy insole, is made from two viscous liquids – isocyanates and polyols (Walking on Air). Polyurethane powder is the form that is most harmful to production workers because it can be easily inhaled. Workers must wear masks when using polyurethane powder to minimize risk of respiratory problems and other health conditions. Some sneakers also have air pockets that contain ozone-depleting gas.

The foamy midsole of the sneaker seems to contain the most harmful chemicals. Isocyanates cause a variety of health hazards when released into the air, including “irritation of the eyes, mucous membranes and respiratory system with symptoms resembling asthma or bronchitis, and decreased lung function” (Agius). Only a small amount of exposure to isocyanates is needed for someone to experience health problems, and the invisible and odorless nature of these chemicals makes them difficult to detect. (Agius) There are many different types of polyether polyols that are used in the production of polyurethane, which are typically less dangerous than isocyanates. Polyols are irritants and can aggravate the eyes, skin, nasal passages, and airways through direct contact or inhalation (Agius). Within the isocyanate and polyol groups are four chemicals: benzene, toluene, ethylbenzene, and xylenes. These chemicals are known as “The Big 4” toxins because they are carcinogens, central nervous system disrupters, and respiratory irritants, among other biological irritants (Goleman).

Benzene is a chemical that is a colorless or light yellow liquid at room temperature, has a sweet odor, and is highly flammable (CDC). It evaporates into the air very quickly and has a heavy vapor that may sink into low-lying areas. Benzene is widely used in the United States, ranking in the top 20 chemicals for production volume. Certain industries use benzene to make chemicals that are used to make plastics, resins, and nylon and synthetic fibers. Benzene is also used to make some types of lubricants, rubbers, dyes, detergents, drugs, and pesticides. The major effect of benzene from long-term exposure (one year or more of exposure) is on the blood.

Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells, leading to anemia. It can also cause excessive bleeding and can affect the immune system, increasing the chance for infection. Some women who breathed high levels of benzene for many months had irregular menstrual periods and a decrease in the size of their ovaries. Animal studies have shown low birth weights, delayed bone formation, and bone marrow damage when pregnant animals breathed benzene. The Department of Health and Human Services (DHHS) has determined that benzene causes cancer in humans. Long-term exposure to high levels of benzene in the air can cause leukemia, cancer of the blood-forming organs (CDC).

Toluene is a clear, colorless liquid with a distinctive smell. Toluene occurs naturally in crude oil and in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and making coke from coal. Toluene is used in making paints, paint thinners, fingernail polish, lacquers, adhesives, and rubber, and in some printing and leather tanning processes. Toluene may affect the nervous system. Low to moderate levels can cause tiredness, confusion, weakness, drunken-type actions, memory loss, nausea, loss of appetite, and hearing and color vision loss. Inhaling high levels of toluene in a short time can cause lightheadedness, dizziness, or sleepiness, and unconsciousness or death in extreme cases. High levels of toluene may also affect the kidneys (Agency for Toxic Substances).

Ethylbenzene is a colorless, flammable liquid that smells like gasoline. It is naturally found in coal tar and petroleum, as well as in manufactured products such as inks, pesticides, and paints. Ethylbenzene is used primarily to make other chemicals, including styrene, and is also used as a solvent and in fuels. Exposure to high levels of ethylbenzene in air for short periods can cause eye and throat irritation. Exposure to higher levels can result in dizziness. Irreversible damage to the inner ear and hearing has been observed in animals exposed to relatively low concentrations of ethylbenzene for several days to weeks. Exposure to relatively low concentrations of ethylbenzene in air for several months to years causes kidney damage in animals. The International Agency for Research on Cancer (IARC) has determined that ethylbenzene is a possible human carcinogen (Agency for Toxic Substances).

Xylenes are a group of chemicals that are found naturally or are produced synthetically, and come in the form of a colorless and sweet-smelling liquid (Environment Agency). They are released into the environment when sneaker soles are produced. Additionally, “xylenes can be toxic to wildlife and are considered volatile organic compounds (VOCs) that can contribute to harmful ground-level ozone formation” (Environment Agency). The biggest problem with using xylenes in sneaker production is the negative effect they have on wildlife, particularly on aquatic organisms.

The United States has many laws enacted to help monitor product manufacturing companies and the chemicals they use, including companies that manufacture sneakers. However, most sneaker production occurs outside of the United States, so these laws cannot apply. For example, many sneaker companies produce their products in China, which does not have very strict environmental laws and regulations. The United States is currently working with China to improve their laws through a program called the EPA-China Environmental Law Initiative (EPA). There is the concern that shoe production companies in China and other countries are not being monitored close enough for fair labor and environmental practices. China accounts for the

production of the majority of shoes that are shipped to the United States. Unfortunately, the shoe production factories are largely contributing to China's deteriorating environment. China "is fast becoming an ecological wasteland, home to some of the world's smoggiest cities as well as rampant water shortages, soil erosion, and acid rain" (Bremner). Not only is the manufacturing and disposal of sneakers polluting our environment, but the chemicals released from these processes are endangering the health of the production workers and everyday consumers.

Every person that walks this earth leaves behind a carbon footprint. A person's carbon footprint is "the total set of greenhouse gas (GHG) emissions caused by an organization, event or product" (Nature Conservancy). Many runners think of their sport as environmentally friendly and believe they have a minimal carbon footprint due to the lack of equipment necessary. However, avid runners frequently purchase new running shoes. The sneakers that runners frequently go through "are made of plastic, the kind of plastic that the human race engineered to last for a thousand years" so their carbon footprint is quite large (Williams). The plastic is made to last for many years, so it is difficult to dispose of and is left behind for generations to come. The different chemicals needed to manufacture sneakers are adding to the gas emissions into our atmosphere and increasing our carbon footprint.

Different companies such as Adidas, New Balance, and Brooks have realized that their products can be harmful and are making changes. Adidas, Brooks, and others have stopped using polyvinyl chloride (PVC was once a footwear staple but is toxic to workers and known to form carcinogenic dioxin when it burns), New Balance and Brooks are using recycled shoeboxes, Mizuno has replaced some plastic with materials made from castor oil; and Nike has pioneered better glues (Williams). Asics is starting to add rice husks to its outsoles (Williams). Oboz, which makes trail running shoes, is planting trees to offset its carbon emissions, and a Portland sneaker company called END, is using partly recycled soles (Williams). Although these shoe companies have the best of intentions of reducing their carbon footprints, it is often difficult to monitor their green tactics because their shoe components are imported from several different manufacturing locations around the world. It is difficult to keep track of the manufacturing practices in China and Indonesia for a headquarters located in New York City.

While the manufacturing of sneakers is detrimental to the environment and people, the improper discarding of sneakers is even more deleterious. Sneakers are not biodegradable, so they stay in landfills forever without breaking down or must be incinerated instead. The harmful chemicals get emitted into the soil and the air, which directly pollutes our surroundings.

### **The Service Project**

To help combat the environmental problems associated with throwing away old athletic shoes and sneakers, our group held local sneaker recycling drives throughout the Rutgers community and surrounding areas. Sneakers were collected at a Rutgers Field Hockey game, a local middle school, and among friends and family in the area. The shoes that we collected were donated to the Nike Reuse-A-Shoe program, which is responsible for turning old sneakers into Nike Grind, the very material used to make tracks, basketball courts, tennis courts, and playgrounds. Our goal of collecting at least 100 pairs of shoes to donate was achieved.

Additionally, we are interested in expanding upon the Nike program with our Adopt-A-School idea. Instead of simply donating sneakers to the Reuse-A-Shoe program, groups will be able to pick a school or recreational facility seriously in need of a new athletic surface or playground and collect shoes specifically for that facility. For example, the high school in New Brunswick may be in need of a new indoor basketball court, so our group would set out to collect sneakers specifically for this cause. We wrote and sent a proposal to Nike about this idea.

### **The Nike Proposal:**

To Whom It May Concern:

We are students at Rutgers University in New Brunswick, NJ who are inspired by your Reuse-a-Shoe program and have centered a class project around this program. For our project, we researched the detriments of throwing away used sneakers, and the benefits of recycling them. We held sneaker recycling drives at a Rutgers field hockey game, at a local middle school, and also individually collected shoes from friends and family. This project has helped us realize that certain populations are more in need of athletic surfaces than others. Underprivileged school districts who cannot afford new athletic surfaces may be able to benefit from Nike Grind.

We are suggesting a program in which Nike donates a surface to one of these underprivileged schools, free of charge for that school district. This program would be similar to the "Make a Wish Foundation" where the wishes of children with life threatening diseases are met, or similar to "Box Tops for Education" where students and people from the community bring in box tops from General Mills' cereal boxes and these box tops can be turned into money to improve schools in the community. Nike would adopt one school per year, and a certain portion of shoes that are donated to Nike will be allocated for that specific school. Nike would advertise on their Reuse-a-Shoe website for this cause, and ask for monetary donations to fund the construction and implementation of the surface. Nike would fund any additional fees necessary that the donations could not cover.

We would like you to please consider putting our community service idea into action, and we would be more than willing to help in any way to get it started up. As runners and Rutgers athletes, we are particularly interested in seeing others benefit from fitness and sports that we enjoy. We have spoken to other athletes in the Rutgers community who are also interested in making this non-profit idea a success. In the New Brunswick community, we see many children who play outside in parking lots or on the streets, but could truly benefit from more advanced athletic facilities. If you have any questions about our proposal, feel free to contact us or our professor, Julie Fagan, at a time that is convenient for you. Thank you very much for your time.

Sincerely,

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“The Mercury” – Pottstown, Pennsylvania

A group of students in the Rutgers University community, one of them being a resident of Pottstown, Pennsylvania and former Owen J. Roberts student, took an interest in the harmful effects that sneakers can have on the environment. Sneakers are harmful to the environment in their manufacturing and disposal. They are manufactured with “the big 4” chemicals which are; Benzene, Toluene, Ethyl Benzene, and Xylene. These chemicals are carcinogens, central nervous system disrupters, and respiratory irritants, among other biological irritants and are released into the environment during the manufacturing process and their disposal. Most sneakers are burned and not recycled which releases the harmful chemicals and exposes them to humans and the environment. The Rutgers University group collected sneakers from a local middle school, at a Rutgers University Field Hockey game, and from other college students. These shoes are being taken to the Nike Reuse-A-Shoe program where they are to be recycled and turned into tracks, basketball courts, tennis courts, and playground surfaces. Recycling the shoes reduces the amount of harmful elements released into the environment and provides a safer alternative. Nike sponsors groups to donate large amounts of shoes and for more information you can visit; <http://www.nikereuseashoe.com/>.

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Three Rutgers University students, including Melissa Bowman of Ronks, held a shoe drive to help the environment. The chemicals involved in the production of sneakers are very detrimental to the atmosphere. These chemicals are also damaging to the environment when sneakers are disposed of improperly. Many components of sneakers are not biodegradable and add to the

massive amount of trash that has already accumulated on the Earth. These students decided to do their part in helping to reduce all of these harmful effects.

Nike sponsors a program called Reuse-a-Shoe and this is the program the students donated the sneakers to. Nike invites people to donate their old shoes at one of their collection sites located across the country. These shoes are then broken down into different components and are used to make athletic facilities such as basketball courts, tennis courts, or tracks. Not only are the harmful effects of thrown away shoes avoided, but also in need organizations like YMCAs get new athletic facilities.

For more information visit: <http://www.nikereuseashoe.com/>

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### Recycling Used Running Shoes

Most people decide that their unwanted, worn-out sneakers belong in the trash or stored somewhere deep in their attics. However, most people are not aware that used sneakers can be recycled and molded into new things, such as athletic surfaces and playgrounds. Another reason to recycle sneakers is that throwing them in the trash harms the environment. Sneaker materials are created from harmful chemicals such as benzene, toluene, ethyl benzene, and xylene. These toxins can cause cancer, disrupt the nervous system, and irritate the respiratory system. Since sneakers are not biodegradable, they sit in landfills for an eternity, spreading these ozone-depleting chemicals into the environment and creating health risks for people.

Recycling running shoes has a positive environmental and societal impact, and with increased awareness of the negative environmental impact that throwing away sneakers has, more people may be inspired to throw their sneakers in a Nike Reuse-A-Shoe bin instead. This Nike program is responsible for literally turning old sneakers into Nike Grind, a material used to make new tracks, basketball courts, tennis courts, playgrounds, and other athletic surfaces. There are several Nike sneaker drop-off locations across the nation, a few of which are located in New York City, so individuals can conveniently donate up to 10 pairs of shoes at a time. Organizations can also apply online to have Nike sponsor a sneaker drive for them, with the goal of collecting up to 200 pairs of sneakers for the program.

Nike should be commended for their innovative recycling program. Not only does recycling sneakers help to conserve our diminishing atmosphere and prevent toxic chemicals from harming people, but it helps to promote fitness for our youth by creating new athletic surfaces. Nike could, however, expand upon this program in a more community-service oriented way. For example, Nike could create an “Adopt-A-School” program, in which groups will be able to pick a school or recreational facility seriously in need of a new athletic surface or playground and collect shoes specifically for that facility.

Individuals or groups can hold their own sneaker drives (without Nike sponsorship), and then individually drop off the shoes at the Nike locations. Word of mouth is possibly one of the most effective methods of getting people to recycle their sneakers. Informing family members, friends, and colleagues that sneakers can actually be recycled will go a long way. Even if sneakers are not donated to Nike, many communities have shoe drop-off bins, in which shoes are given to those in need. Throwing away old sneakers may not seem like a big deal, but for a nation struggling to become “greener,” fitter, and healthier, we should first stop to think if there is another option. For our wellbeing and that of others, recycling is the best alternative.

For more information on the Nike Reuse-A-Shoe program, visit [www.nikereuseashoe.com](http://www.nikereuseashoe.com).

- Samantha M. Stringham