23rd Elementz Fair

Project Code: SS23

Project Title

Introducing The Team

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What is fast fashion?
How does it affect us negatively?

- Fast fashion is an approach of fashion design, creation and marketing that emphasizes high volumes of low-cost clothing and accessories using low-quality textiles and dyes, companies which support fast fashion are able to mass produce cheap clothing which are quickly pumped through stores to satisfy short-lived consumer fashion trends.
- Fast fashion moves from consumers' closets to the garbage just as quickly as it is produced. Factories dump poisonous wastewater into rivers while releasing millions of tons of greenhouse gasses for clothing that end up burnt, in landfills and in oceans. Production of fast fashion uses [8,000 different synthetic chemicals](), most of these toxic chemicals are found in the dyes that color the clothing, in the corrosive finishing and bonding agents, and in the synthetic textiles themselves, which are known to cause cancer and other diseases in humans.

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How does fast fashion affect us negatively?

- The consequence seems disastrous to humans (community)

- Workers are constantly exposed to these toxic chemicals and are breathing in their fumes which negatively affects their health. Carcinogenic and hazardous chemicals are at the core of fast fashion. Inhaled plastic microfibers may persist in the lung and as a result, could cause inflammation. It has been hypothesized that this could lead to health effects including reproductive problems, cancer, and DNA damage. Particle pollution such as asbestos and fine dust has long been known to damage lung tissues, leading to cancer, asthma attacks, and other health problems. If inhalation of microplastics is sufficiently high, these plastic particles may cause similar health problems. Multiple research reveals people working with plastic-based textiles and dust are at an increased risk of respiratory problems. Moreover, it affects them badly as 80% of apparel is made by young women between the ages of 18 and 24, evidence of forced and child labour often forced to work 14 to 16 hours a day, 7 days a week. During peak season, they may work until 2 or 3 am to meet the fashion brand's deadline.

- The wastewater emitted from factories flows into our waterways and seeps into our agricultural systems. 60% of clothes are made of synthetic materials derived from petrochemicals. These do not decompose, but rather break down into smaller and smaller fragments called microfibers. Not only does it waste pollutues alot of water, it waste alot of water sources. Over 92 million tonnes of waste produced per year and 79 trillion liters of water consumed. 700 gallons to produce one cotton shirt and 2 000 gallons of water to produce a pair of jeans.

- Fast fashion emits 1.2 billion tons of CO2 per year, more than air travel and shipping combined. Fast fashion also produces 20% of global wastewater, contaminating rivers, oceans, drinking water and soil. 60% of clothes are made of synthetic materials derived from petrochemicals. These do not decompose, but rather break down into smaller and smaller fragments called microfibers. Lastly, over 92 million tonnes of waste produced per year and 79 trillion liters of water consumed (resources wasted)

- Wastewater (biodiversity). Contaminants in water bodies are toxic to aquatic life, often reducing lifespans and harming the ability to reproduce in aquatic animals. These contaminants can then spread to other animals up the food chain. Eventually, when these shellfish and fishwhich contain microfibres gets sold at the market, it poses a threat to human health. It also acidifies oceans and makes it difficult for shellfish and corals, Nervous systems of sharks, clownfish and other marine life may be affected as well. Water sources are dried while we pollute the oceans with 500 000 tons of microfibres each year.
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  - envirnoent
- Synthetic materials used in clothing & textiles such as polyester, acrylic, and nylon represent about 60% of the clothing material worldwide. Out of this 60% of synthetic materials, polyester is the most popular material in the fashion industry because of its availability, durability, resistance, and affordability.
- When manufactured, washed and worn, synthetic clothes & textiles shed tiny plastic fibers that end up in the environment. Plastic that ends up in the environment does not biodegrade: it gets fragmented into smaller pieces. These tiny pieces, called microfibers, are smaller than 5 mm and usually not visible to the naked eye.
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  Air (Environment)
- The fashion industry emits more carbon than international flights and maritime shipping combined.
- Fast fashion released 2.1 billion metric tons of greenhouse-gas (GHG) emissions in 2018, about 4 percent of the global total. To put that in context, the fashion industry emits about the same quantity of GHGs per year as the entire economies of France, Germany, and the United Kingdom combined.
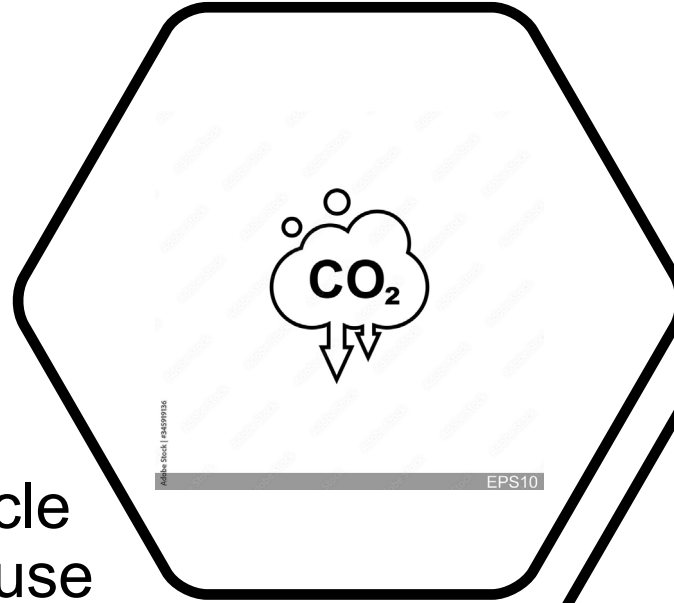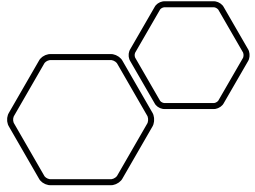-

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- fashion production comprises 10% of total global carbon emissions, as much as the European Union. It dries up water sources and pollutes rivers and streams, while 85% of all textiles go to dumps each year. Even washing clothes releases 500 000 tons of microfibres into the ocean each year, the equivalent of 50 billion plastic bottle
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As current technologies are still [unable](#) to effectively recycle textile fabric, especially because most fast fashion is made of a mix of synthetic, petrochemical-derived fibers such as polyester, we came out with this idea to cope with this issue. We plan to make one shirt which patterns and designs can be changed. This reduces the use of polyester because it prevents the need to buy more shirts of different designs, slowing down the effect of fast fashion. This would save the earth in the long-run.

Our prototype

- There will be 2 expected product.
1. A rendered animation concept (Shirt)
2. Prototype (Bag)
- For prototype one. By using Procreate, we will create a frame-by-frame animation which will help to represent the shirt as it changes its design and color to sell the concept
  Although our prototype is sold as a concept. We have made a prototype to illustrate what it means on a smaller scale and how it would look like with different accessories. The bag would be printed using a 3D printer. After the printing is done, we would add LED lights to it by soldering it onto the prototype. For users who want to make the LED lights change color, they would need to access the website that we build. By opening the website, users can either download premade templates or draw their design in the space provided. Next, users need to download the drawing into a file which will be sent to the arduino board for processing. Once the drawing is processed the respective LED lights would light up showing the design. Allowing our product to metamorphosis into different patterns based on the user's preference
- Elaborate on your proposed solution and how it addresses the problem.
- Our solution would take on a "one shirt fits all design approach" whereby users would be able to create and choose their shirt prints based on their desired patterns. With the use of the website we created, users can project their wanted design onto the t-shirt. We plan to make a shirt as well as accessories like bags which can change its design using digital technologies and hardware such as using an arduino to control the change in color by the LED as well as a website that modifies the design. Allowing our product to metamorphosis into different patterns based on the user's preference. With this, people would just need one shirt in their closet due to the ability to change patterns with the ongoing trend. Additionally, it saves on expenses. Best of all they would not need to have the hassle of having a dilemma in the shop of what design to buy because they can just print the design they want of the shirt.
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- The user can draw or download their design onto a website, which will be processed by the arduino board, which will cause specific LED lights to light up to show their design.

- The Arduino **communicates with modules and sensors by switching on and off electrical current**.

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Slide for pic of final work

Analysis

- Strength
- Weaknesses

- LED may break upon impact.
-                         Cannot be washed (wipe)
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- Strength: Saves the earth

How is STEM used in our project

- Technology: coding of board, web development

- Science: Science of LED, electricity current. (in dept research on led to btr understand it so we can do btr). We learnt that…

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    LEDs at their basic level are a latticework of Si (silicon). The nature of this atom when combined with other Si atoms is to form a network of non-charged bonds between themselves. This non-charged state makes pure Si non-conductive meaning it will not carry an electrical current. Scientists have found a way to allow just a little amount of energy to pass through the lattice work of Si by replacing a minimal amount of Si with other materials and arranging them in a way that the energy flow is controlled.
- A diode, as in LED (Light emitting *Diode)*, is a combination of different materials that does this and as a result light is emitted. As electricity passes through these materials the electrons in the compound become *excited* and emit photons of light. The materials used in the lattice work can control the different colors and intensities of the light emitted.
- Blue LEDs are coated with a layer of phosphor and have their blue light pass through a phosphor layer some of which is absorbed by the fluorescent layer which causes the phosphor to glow in green and red spectrums, causing the light to appear white.

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How is stem used

- Engenerring product

- Math
- symbols used in coding + - / * > < =
- Engineering; product itself, 3d

flaticon