WISE-Tech Design: Eco/Durable 3D Printed Athletic Shoes

Naiha Ali

Grade 10 Science

Stephen Lewis Secondary School

Nike factory

Where shoes end up

Polyurethane: Material that shoes are made with.

Ninjaflex: Material that is flexible and tough to break..
Be light weight, yet alleviate pain

Soft and comfortable

Strong grip and easy to move with

Durable

Shoe factory

Ankle sprains are common from athletic shoes

(Keep muscles/bones in the ankle safe)

After 3 months of use

Producing durable and eco athletic shoes

Product feature /material	Curriculum link	Citation
Shape and cut of the shoe (Holes)	B3. demonstrate an understanding of the hierarchical organization of cells, from tissues, to organs, to systems in animals and plants. Biology: Keeps the feet more secure and alleviate pain. New shoes, worn out shoes or the wrong size can put stress on the Achilles tendons, which is located at the back of the foot, above the heel. If the tendon is swollen or irritated it could lead to Achilles tendonitis, and if that's not treated it could be hard to walk.	https://kidshealth.org/en/teens/achilles.html
NinjaFlex	C1. analyse a variety of safety and environmental issues associated with chemical reactions, including the ways in which chemical reactions can be applied to address environmental challenges; Chemistry: Ninjaflex burns and 3D prints at the temperature 210°C - 225°C. For this specific shoe it was printed at 218°C. D2. investigate various natural and human factors that influence Earth's climate and climate change; Climate change: NinjaFlex is made by a material called thermoplastic polyurethane. One of its properties is abrasion resistance (doesn't scrape or break easily). Regular shoes contain urethane, which are toxic and easily release dust and shavings, which is harmful to the environment.	https://filaments.ca/pages/temperature-guide http://pediaa.com/difference-between-tpu-and-pu/ http://www.phlmetropolis.com/2011/11/the-case-of-the-crumbling-shoes.php
3D printing	D3. demonstrate an understanding of natural and human factors, including the greenhouse effect, that influence Earth's climate and contribute to climate change. Climate change: Less toxic emissions are created from 3D printing, whereas shoe factories use multiple machines letting out harmful chemical (Carbon dioxide, phthalate and hydrocarbons)	http://en.hesperian.org/hhq/Workers%27%20Guide%20to%20Health%20and%20Safety%20Pollution%20from%20shoe%20factories https://theshoindustry.weebly.com/environmental-impact.html
Lack of packaging and shipment	D1. analyse some of the effects of climate change around the world, and assess the effectiveness of initiatives that attempt to address the issue of climate change; Climate change: Rather than sending and packaging shoes, the blueprint for the model of the shoe can be put online. Transportation from vehicles or automobiles causes pollution. Smog, carbon monoxide and other toxins are released. Posting the model/ blueprint online allows people to access it worldwide and is more eco friendly.	https://www.nationalgeographic.com/environment/green-guide/buying-guides/car/environmental-impact/

DESIGNING AN ATHLETIC SHOE

My Product Incriptions

(A product *design feature* that encourages the user to behave in a more STSE sensitive way)

Product feature: Lack of packaging and shipment:

Rather than sending and packaging shoes, the blueprint for the model of the shoe can be put online. Transportation from vehicles or automobiles causes pollution, smog, carbon monoxide and other toxins are released. Posting the model/ blueprint online allows people to access it worldwide and is more environmentally friendly.

<https://twitter.com/DaveDelGobbo/status/1127300004283072519?s=20>