

# CATERPILLAR

## Children shoes

Children grow at a fast pace and because of this their garments and footwear have short lifespans. “Caterpillar” shoes are designed to integrate flexible materials and a lacing system that expands and compresses up to three sizes. The modular design also allows users to personalize the shoes according to individual styles and to replace components that tend to wear out often.



### Design Goals

- Lifespan extension for products that are replaced often
- Easy product repair and part replacement
- Versatile design that can be resized easily
- Interchangeable components for product personalization
- Use of flexible, durable materials



### Fusion 360 Features

- Modeled in “Sculpt” mode
- Quadball > overall form
- Edit Form > refinement
- Thicken > wall thickness and layers for sole
- A360 > cloud rendering

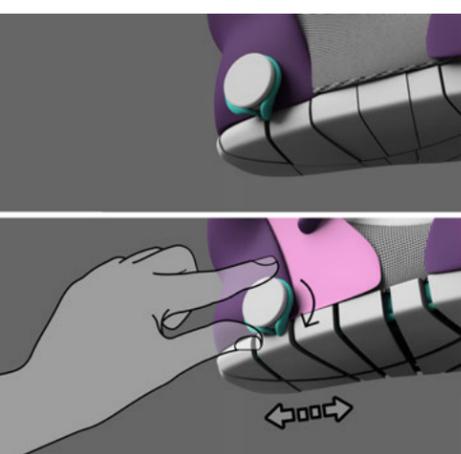


### Sustainability Strategies

- Improving product lifetime
- Persuasive design engages user in expanding/compressing shoe
- Product durability
- Design for repair/disassembly

### Size adjustment

The upper section of the shoe uses a series of three thin layers that can be extended and contracted by adjusting a knob in the center of the shoe. The knob eliminates the need for traditional laces and adds a playful interaction to the user. The mid section and sole of the shoe is composed of flexible rubber sections that change sizes by simply expanding and contracting. The user controls the dimensions of the sole by turning a knob on the side, adjusting the length of a strap running around the side of the sole.



### Reduced carbon footprint

Children ages two to five grow half a shoe size every three to four months, which results in the purchase of several pairs of shoes each year that have had little use before being tossed away. Caterpillar shoes can adjust to three different sizes, allowing them to be used up to three times as long as traditional shoes, reducing the carbon footprint generated by the fabrication of new shoes while also reducing the overall expense that goes into purchasing children shoes.



### Custom fit

The use of materials with different densities and levels of flexibility allow for the shoes to expand to different sizes and also adjust to different types of feet. Depending on how compressed the sections are, the shoes can achieve different levels of arc support, compensate for over or under pronation and adjust to different widths.



### Modularity

Caterpillar shoes are designed with multiple components that are easy to remove and replace. This feature allows for easy personalization based on the user’s choice of colors, finishes and materials. The modular design also allows for easy replacement of parts such as the sections of the sole that tend to wear out frequently or that may become defective.

