针织功能运动服设计
Compression Sportswear Design

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Contents

- Objective
- Compression Sportswear
- Socks
- Shoes
- Astronauts Footwear

1. Background Research
2. Our Focus
3. Precedent Research
4. Design Concepts

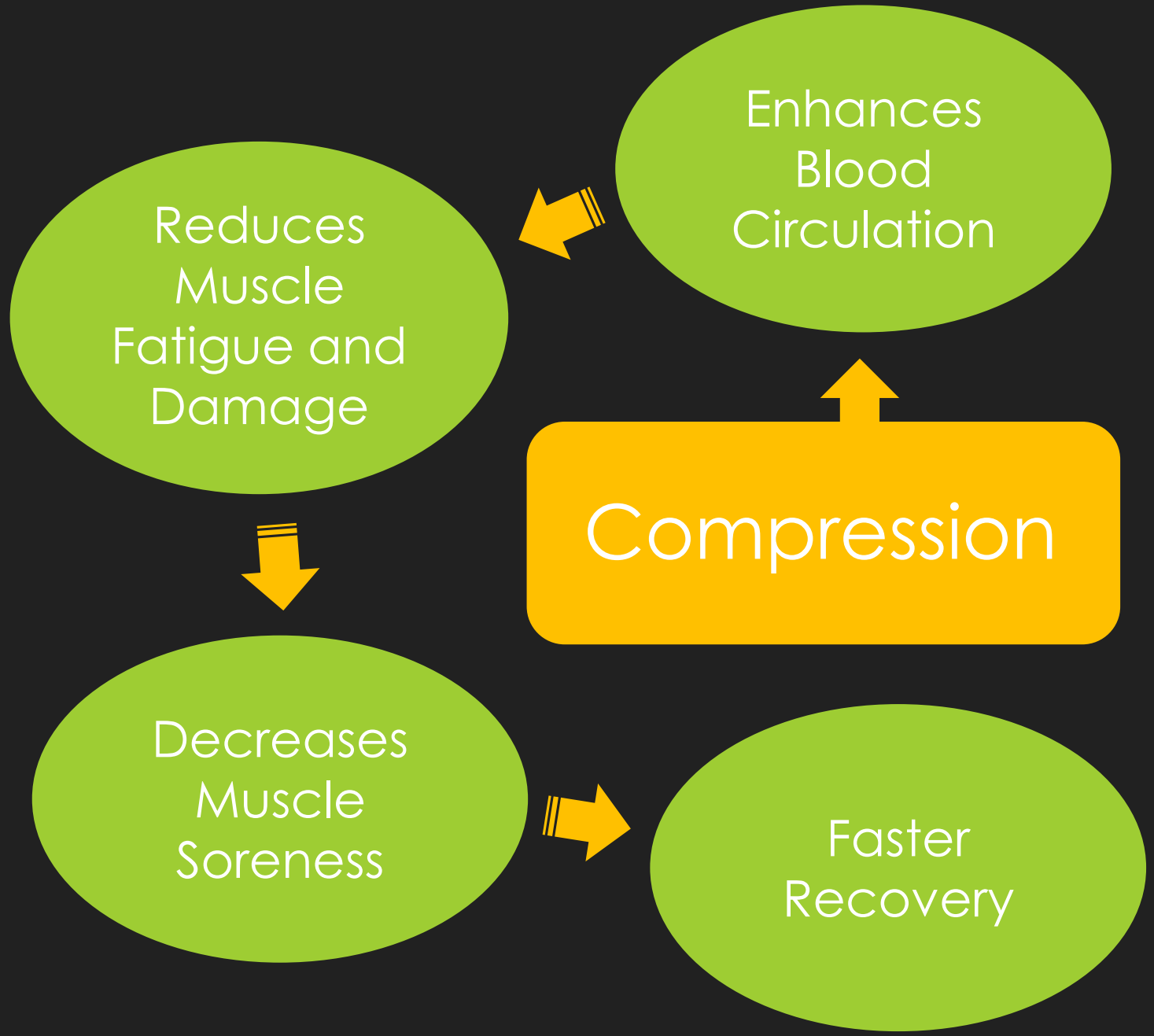
Objective:

To **analyze** and **design** compression sportswear, socks and shoes for **running.**

Compression Sportswear

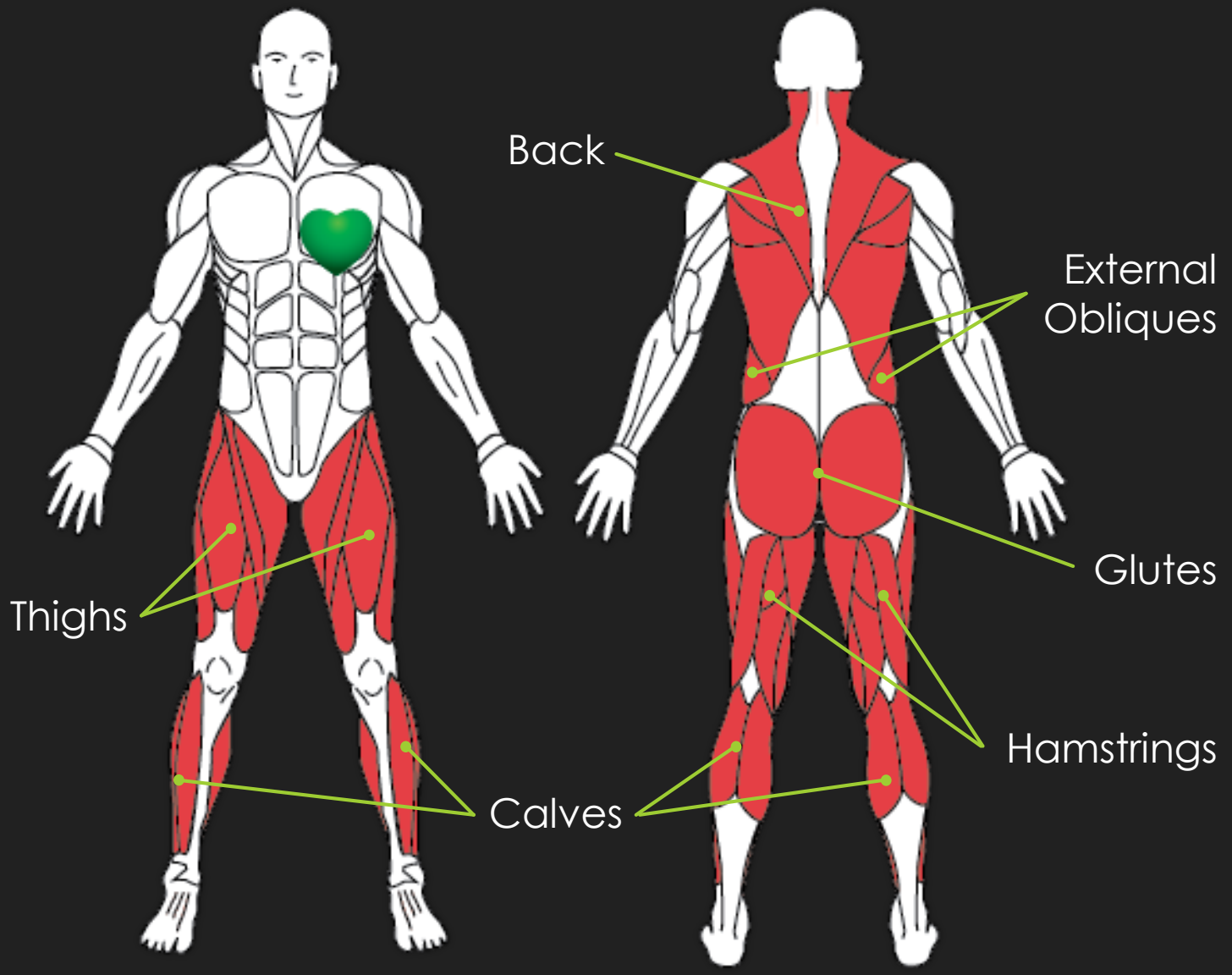
Background Research: Benefits & Attributes

- Compression sportswear **applies pressure** on specific areas of the body to **enhance circulation.**



Background Research: Muscle Anatomy

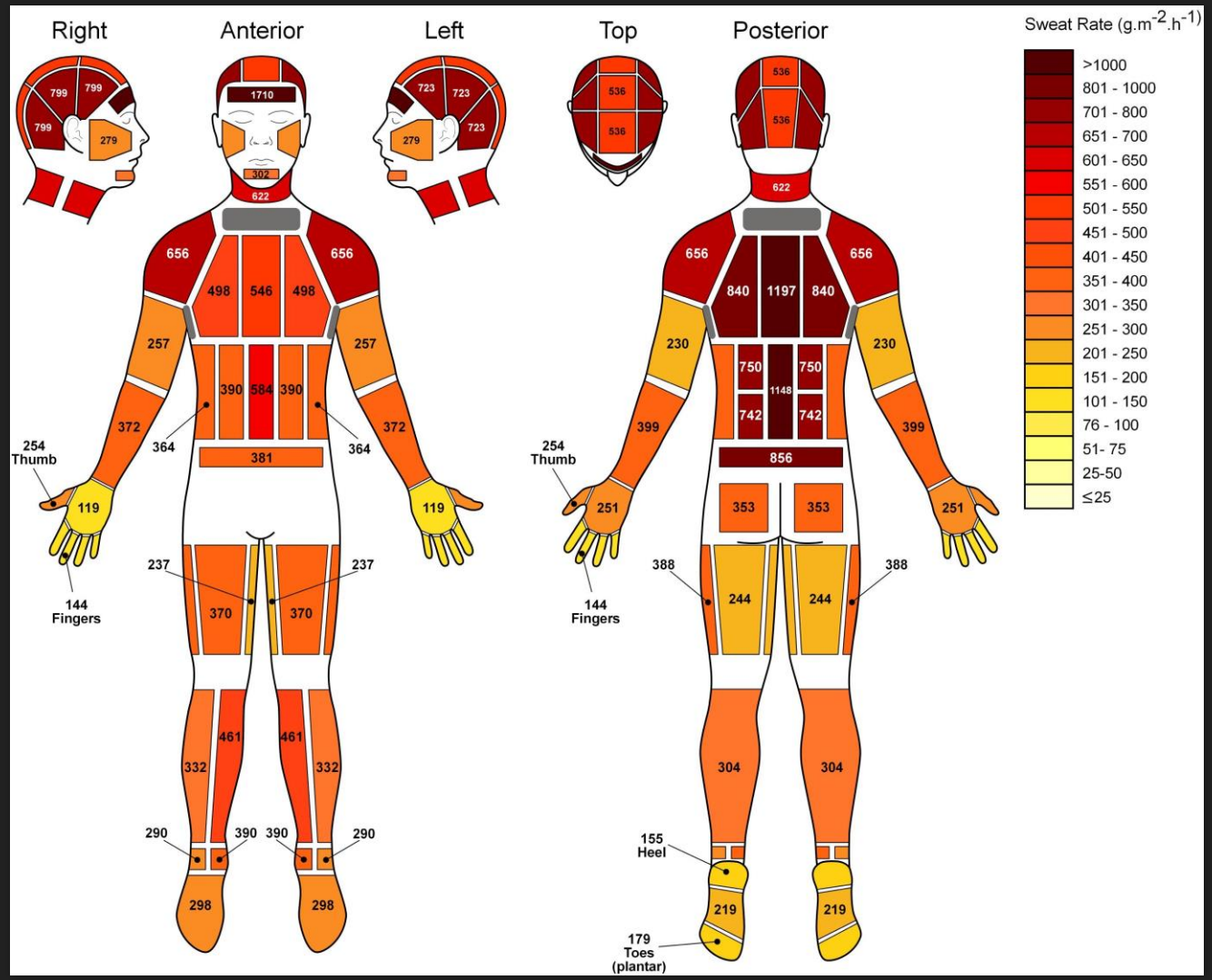
- These are the **muscle groups** used while running
- The sportswear should be **looser at these areas**



Background Research: Sweat Zones

- Highest sweat zones (>700 $gm^{-2}h^{-1}$) are the **forehead and back**
- High sweat zones (500-700 $gm^{-2}h^{-1}$) are the **neck, shoulders and lower chest**

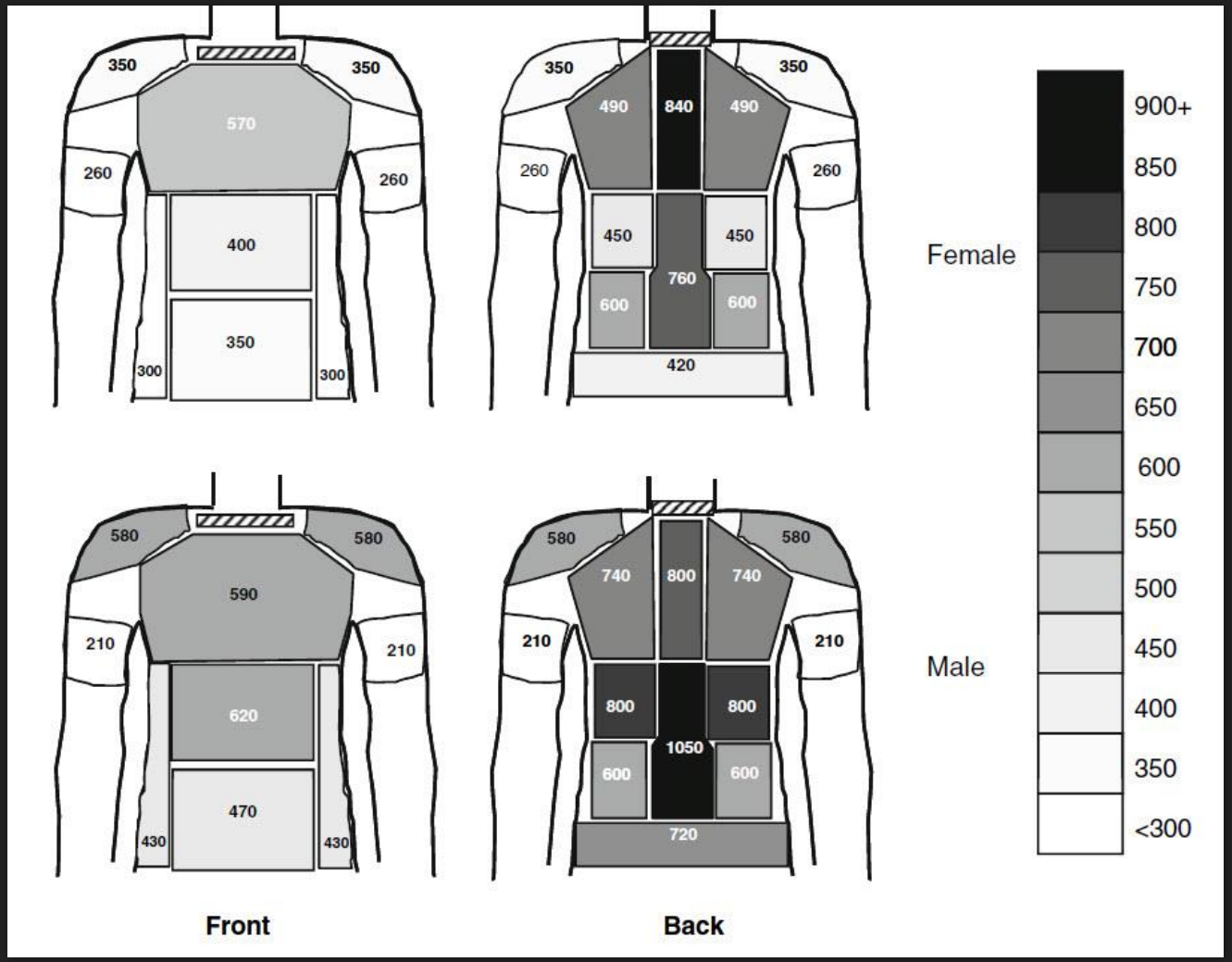
➢ The sportswear should have **ventilation points** at these areas



Background Research: Sweat Zones

- Females sweat more at the **upper back**
- Males sweat more at the **lower back**
- Males generally sweat more than females

➢ Design of the sportswear should fit accordingly to the differences in the male and female anatomy



女

男

Our Focus

What do **you** look for in a compression sportswear?

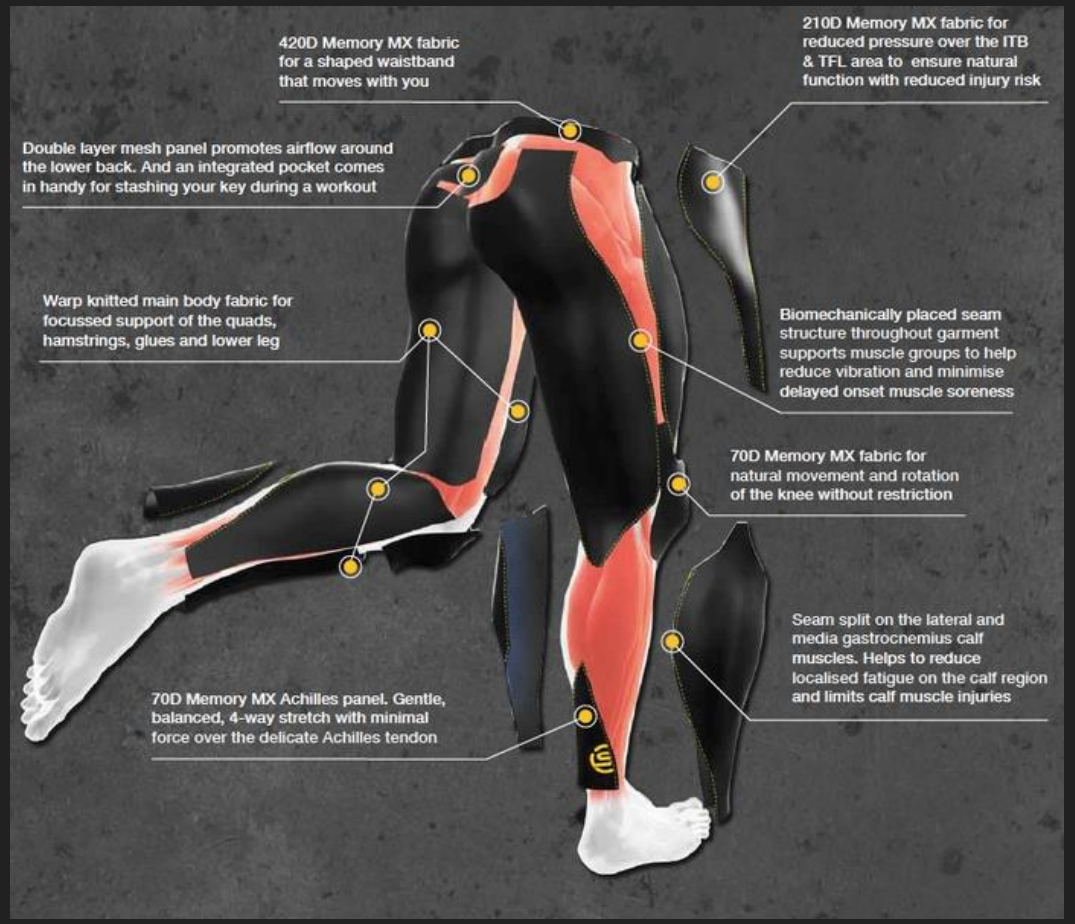
Precedent Research: SKINS A200 & A400 Series

- **Dynamic Gradient Compression** - provides the correct level of surface pressure to specific parts of the body

1. High quality yarns for consistent, controlled compression and advanced durability.
2. Superior moisture management keeps you dry.
3. Special anti-chafing yarn reduces heat, moisture, friction and the risk of blisters.
4. Soft fall cushioning absorbs shock and enhances comfort.
5. Smooth, comfortable toe seams reduce friction.
6. Anatomic left and right construction for a comfortable fit.

Precedent Research: SKINS A200 & A400 Series

- Different levels of muscle support for muscle groups
- **Memory MX fabric** – returns to original shape even after long use
- RY400 tights are **76% nylon** and **24% spandex**
- Wi**cking treatment** – removes moisture from skin to the outside of the garment



Design Concepts

By analyzing our background and precedent research, our design for compression sportswear should include:

- Gradient Compression
- Proper muscle support for the muscle groups used in running
- Ventilation points according to male and female anatomies
- Wicking Treatment

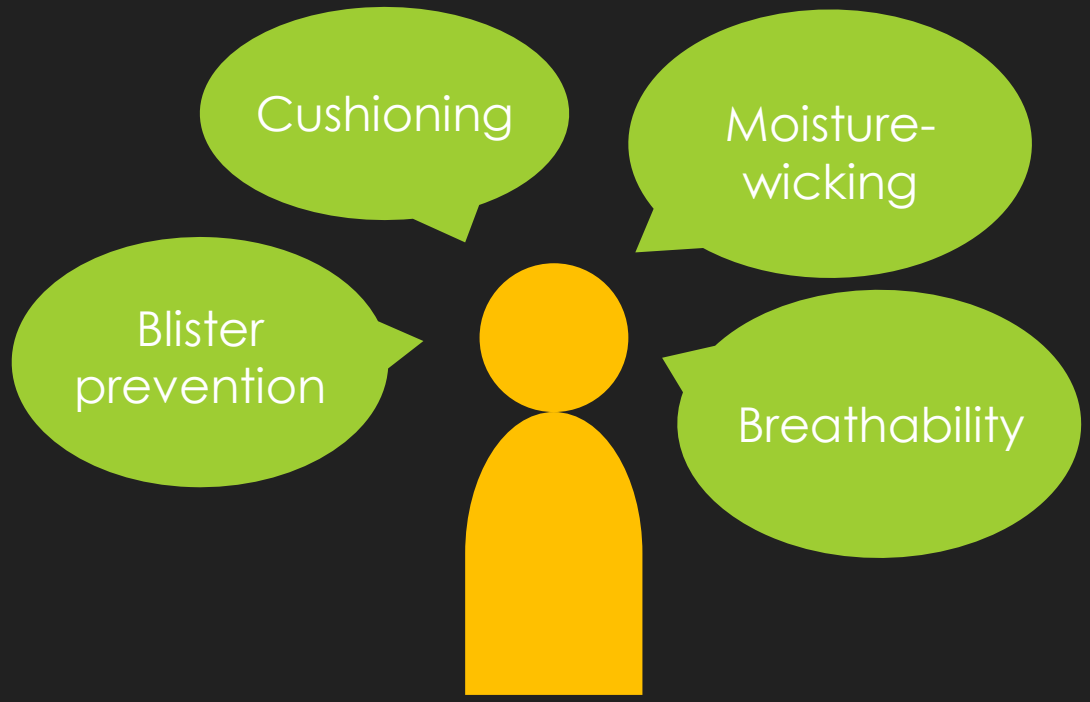
Socks

Background Research: Attributes

Socks are worn as a protective layer from the inside of the shoe. Over time, socks have evolved to meet the demands of the different kinds of sports and activities.

Our Focus

What do you want **your socks** to have?



Precedent Research: injinji Trail 2.0

- **5-toe system –** helps to properly align your toes
- Promotes **proper posture**, and **prevents blisters** by keeping your toes dry and stopping them from rubbing

Precedent Research: Swiftwick Vibe Two

- Compression **helps prevent swelling** by forcing blood flow back above the ankle
- The lack of swelling keeps the feet **comfortable and less irritated**

Precedent Research: Darn Tough Vermont Run

- **Seamless design** and **Merino Wool** blend – makes it incredibly **comfortable**
- **L shape design** – which feel natural around the foot

Design Concepts

Combining the three unique features, our design hopes to incorporate:

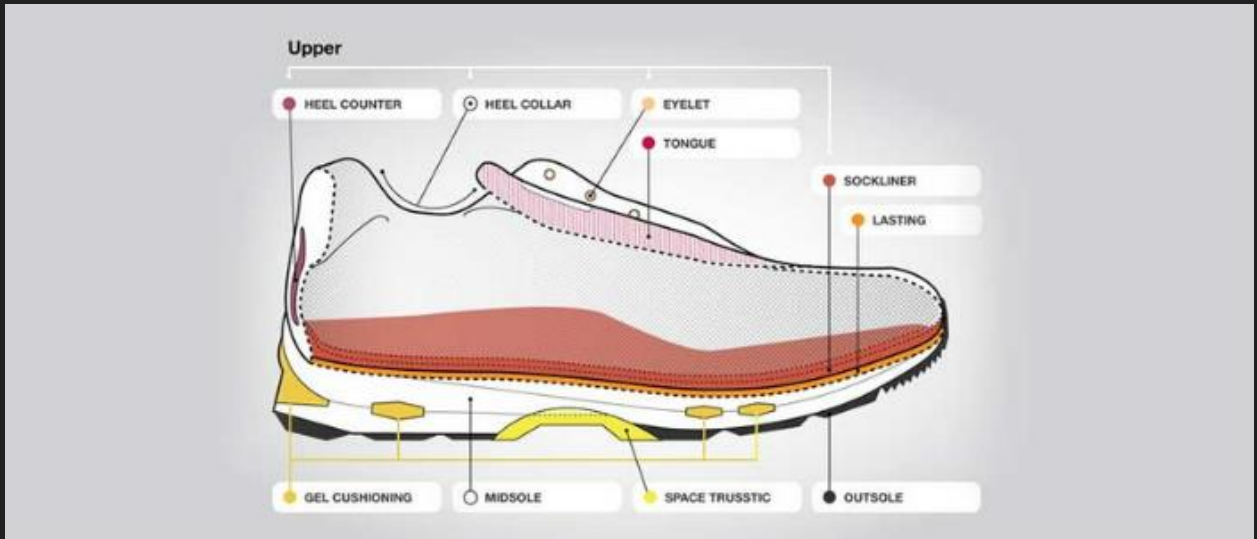
- 5-Toe System
- Compression Effect
- L-shape sock
- Sufficiently padded
- Breathable
- Moisture wicking

Shoes

Background Research: Attributes

Shoes comes in many varieties. The shape and design depends largely on the nature of the sport and the needs of the user. Even in running shoes, there are thousands of different designs.

Our Focus



- Good support and structure
- Good cushioning
- Light
- Comfortable
- Breathability

Precedent Research: Adidas Springblade Razor

- *"Each blade is precisely tuned in geometry, thickness and position for each phase of a runner's stride to* ***provide support*** *and* ***a full range of movement****."*

Precedent Research: Puma Mobium 2.0 (S110)

- **Adaptive footwear** – the shoe will expand longitudinally, laterally, and vertically to help promote a more "natural" stride
- **Expansion pods**, which were inspired by the splaying of a cat's paw – help **provide flexibility** and **protection**, especially for mid-foot strikers.

Precedent Research: Nike Free Flyknit 4.0 ($120)

- **Flyknit technology** – crafting a running shoe with a single, featherweight, virtually seamless, knit upper
- The result is an unconventionally **snug, sock-like fit** with just the right blend of stretch and structure to **support runners for miles**

Design Concepts

- After visiting YiWu Seamless Garment Research & Development Center, we decided to use their technology to design our shoe
- Our design would be largely similar to Nike's Flyknit models

How about our astronauts?: Astronaut Footwear

Background Research: Inside a space shuttle

Inside the space shuttle:

- pressure
- temperature
- humidity

are controlled, so that the astronauts can live comfortably.

They usually dress in the same manner as they do on Earth.

However, they have to work in an anti-gravity environment.

Background Research: Current Practises

Socks only.

Our Focus

Astronaut footwear should include the following:

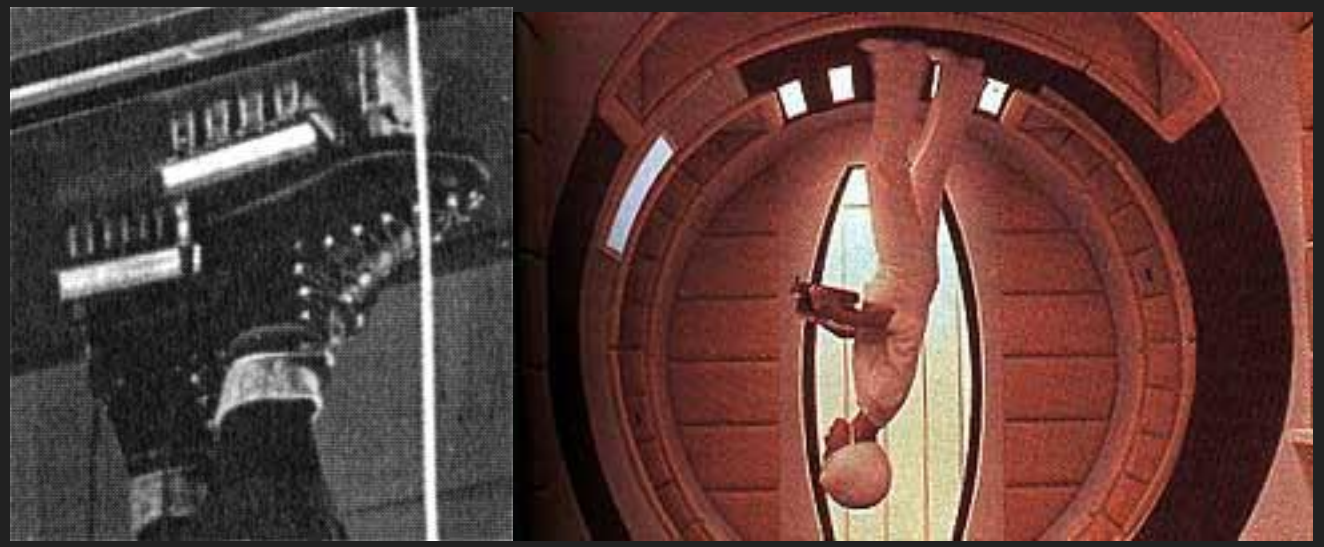
- Protection of feet
- Help them to maneuver about the space shuttle more effectively
- Temperature regulating
- Comfortable

Precedent Research: Japanese Astronaut Shoes

- *"In an environment of no gravity, **human muscles become atrophied** and astronauts need to train themselves on machines"*
- *"By having the slant, the shoes would **stretch a wearer's calf muscles** even in the no-gravity environment,"*

Precedent Research: Astronaut Magnet Boots

- **Magnetic boots** – allow for easier orientation and safer movement inside the space shuttle



Design Concepts

- Sh-ock idea with slant to stretch calf muscles and also to keep the user warm
- Magnetic boots

谢谢各位
Thank you