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Meta

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Adaptable lacrosse pad system for children to provide a safe and economical transition into the sport of Lacrosse.
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Chapter 1: Overview
META strives provide an adaptable lacrosse pad system for children, to provide a safe and economical transition into the sport of Lacrosse.
US Lacrosse the governing body of all mens and womens lacrosse with in the USA classifies any one under the age of 15 to be considered a youth player.
Boys youth Lacrosse participation
A survey conducted by US Lacrosse in 2015 asked over 1,600 parents of youth lacrosse players to find the average age of new players. This was completed for both boys and girls, the survey and represented 47 states. The average age a child began playing lacrosse was **8.5** years of age.

In 2015 for the second consecutive year there were 14 states in the USA with at least **10,000** participants at the youth lacrosse (under 15)

- California
- Colorado
- Connecticut
- Florida
- Georgia
- Massachusetts
- Maryland
- Minnesota
- New Jersey
- New York
- Ohio
- Pennsylvania
- Texas
- Virginia

Along with New York comming in at a wopping **56,335** youth players in 2015.

This growth in the sport it is bringing lacrosse to be the second fastest growing sport in the country as you can see in the graph below the sport has been on an increased rise since the year 2006 - 2015 and is expected to keep growing
**Attack**
The responsibility for scoring goals falls on the attack, who spend games roaming in the opponent’s half of the field. The most productive attackers have more moves than a disco dancer. They must be able to create space between them and their defender to score, all while being poked and checked by the opposing team.

**Midfield**
Lacrosse is considered the fastest game to two feet, and the midfielders’ effectiveness on transitions has a big influence on that. Midfielders typically aren’t counted on to provide much scoring punch. The more important qualities for this position are good stick skills, accurate passing skills, and the stamina to stick with opposing attackers.

**Defense**
Defenders rely on good footwork to shadow opponents all over the field, and they use a variety of checks to pester the attack. Good passing skills also enable defenders to ignite attacks by getting the ball to their midfielders.

**Goalie**
Positions between the goal posts the goalie has the responsibility to stop the ball from going into the net. Goalies face shots from all angles and positions on the field at varied speeds. Good hand-eye coordination and quick reflexes are musts for faring well in this position.
Bench marking
Due the fact that there is nothing like meta out on the market I found that the best way for me to get an accurate representation of the whole chest pad market was to tack a sample of all of the best pads for every position but then break it down even farther and go into the difference in pads for each skill level.
Injury questionnaire
Is there a difference in the amount of injuries between varsity and junior varsity? If so, who would you say has more and do you think it has to do with skill level?

- Yes. We tend to see more injuries at the varsity level. I am unsure if you can say it is because of skill alone. Think it may be more related to intensity. The speed of the game is much faster at the varsity level and hits tend to be harder.

What part of the body do you see the most injuries occur?

- Shoulder and head.

What is the most common upper body injury you have seen. (This includes severe bone bruising)?

- AC joint sprain

“AC Joint Separation. ... A separated shoulder, sometimes referred to as a shoulder sprain, acromioclavicular (AC) joint separation or AC separation, occurs when the ligaments that hold the collarbone to the shoulder blade are injured or separated. The severity of AC separation can range from mild severe”
Chapter 3: Design Development
With the data I collected it gave me a basis to create easy visuals to look at and see just what are the most vulnerable areas of your chest and back while playing the sport of lacrosse.
To fully understand how lacrosse pads are made I first deconstruction already exist in youth chest pad. This gave me a foundation to Build off of when going into the next phases of this project.
After tacking the visuals I then proceeded to start to block out the sections on where to pad in relationship to where it would fall on the actual shape of the chest pad.
It was very important to me to have these pads be not too bulky and allow for moment for the player when being worn.

Due to this I took the larger padded sections and broke them up into clusters of smaller pads to allow for movement but still not giving up any of the protection and safety.
When beginning I took my basic shaped and pined then to my mannequin to see for the first time is every thing that need to be covered was being protected. This also gave me a good idea of scare due to being the first time I got out of drawing and got physical.
My first iteration of a clip that I was going to use to secure my back pad to the under pad but I did not go forward with this due to further research and found that plastic is known to break when hit in lacrosse.
After testing and iteration on this clip system I needed up realizing that using velco would be the best and safest answer to attaching and detaching the back pad.
When starting to get into prototyping with real materials that move and act like the ones I would use in my final model and that would be used in manufacturing I found it very important to place every thing on my mannequin so I know I had the right scale for my target market.
For me to understand all that goes into META whether it be foam plastic or velcor it is a lot so found if I plot out my flats and form them into sets of working it really helped me to understand how everything goes together.
At this point I had every thing cut out and ready to be adhered to the foam and start to get sewin.
When my first model was completed I was fortunate to get to test and get feedback from kids within my target market. The main piece of feedback was that they wanted some kind of color change so it is easier to tell the different positions.
Chapter 5: How to assemble META
Chapter 6: Final Model
Defense
Offense
Goalie
Chapter 7: Final Renders
1/16 HDPE (High-density polyethylene)

Crosslinked EVA foam
Chapter 8: DEC Outcomes
1. Integration & Skills
Integrate the skills and knowledge acquired through the DEC Core curriculum to propose solutions to real-world problems, through:
   a. Strategy Identification  page 4-24
   b. Formulation of value propositions  page 6-15
   c. Identification and explanation of systems  page 6-24
   d. Formulation of research questions  page 14-15

2. Synthesize Interdisciplinary Work
   a. Proposal of solutions/hypotheses  page 4-5
   b. Interdisciplinary collaboration

3. Communicate Findings  page 19-45
   Communicate capstone experience findings effectively using multiple modes

4. Professional Relevance  page 6-15,61-73
   Evaluate the relevant professional, ethical and social responsibilities associated with the capstone experience

5. Global Context  page 4-15
   Explain the global context of the capstone experience

6. Applications | Trends | Technologies
   Interpret emerging applications/practices/trends/technologies as they apply to the capstone experience

7. Capstone Experience  page 1-77
   Relate the capstone experience to relevant contemporary issues
THANK YOU
Thank you to every one for there support through out this whole project but special thanks to

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My professors for all there support on this project and through out the years here at Phila U

And special thanks to Theodore you where a big help and never could have doe it with out you I could neve have asked for a better mannequin

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