My name is Grace. I went to Northcote High School, and I did Product Design and Technology, specialising in Textiles. My design brief was developed to address the concerns of parents who live or holiday in high fire prone areas, with young children aged 6 to 12. I specifically felt that this was really close to home because I grew up in an area that was fire prone, so it encouraged me to find a solution that could be real, that would actually help people.

When you look at a lot of young children's clothing, all of the labels say things like “keep away from fire” or “highly flammable”, all that stuff. Which I thought was really concerning because, when you're preparing for fire safety, typically parents will say “take long-sleeved things to protect your arms and legs”.

But regardless of the protection they offer, they're still quite flammable because of the cheap materials that they're made out of. So I designed a fire-retardant jacket for young children. The entire outer shell is completely fire retardant. In the cuffs and the sleeves there's a black half glove that is sewn into the sleeve so it's completely lined, so that debris and ash can't go up the sleeve. This just adds another layer of protection from the elements.

The reflective strips were there for low light situations. If you've got torches looking in smoke, you'd hopefully be able to find them. And then the LED lights were only to enhance that. So in terms of safety, that was really for identification. With the trials that I did with my end user, he loved them. He thought they were fantastic, so it was actually really good that they also appealed to a young audience.

Similarly, with the whistle, that was the same thing. End users found that really exciting, but it also worked really well in tandem because it was a safety precaution. I did a lot of research with a broad range of end users, asking what they felt would be the easiest for young children to take on and off.

So, there was the concept of press studs, buttons, zips, and Velcro. They were all options. But, when thinking about the extreme temperatures that they would have been exposed to, I felt that there was the potential for zips to melt, and press studs and buttons also melt/ be really difficult for young children to do up themselves, whereas the Velcro seemed like the most viable option because, even if you do it up incorrectly, it still offers quite a lot of protection.

If you don't quite match up the bottom and the top, it's still going to stick together, and it's really, really easy for a kid to just press together. So I ended up going with a lightweight cotton. A lot of the initial research was into Nomex and Kevlar, which are industrially used fabrics for fire fighters. But they're very heavy and they're quite thick. And I felt when working with a young child, they'd simply just be too overbearing.

It wouldn't be easy for them to move around. If they tripped, they wouldn't be able to get up. So the cotton was really the best solution with the chemical treatment because it was lightweight. It was breathable so that they wouldn't overheat at the same time. And it came in a much more diverse range of colours that appealed to the end users.

I was supplied that by the ADA, the Australian Defence Apparel, who were so lovely and showed me around and gave me about 3 metres worth of fabric for my product and just said “show us what you've done at the end”. So that was so fantastic, and I was really lucky that they had that on-hand and they were able to provide that to me.

So I actually did some quite fun trials which involved setting the fabric on fire in my back garden - safely. So when in direct contact with flame, it smoulders slightly but doesn't catch alight. And as soon as the flame is removed from the jacket, it stops burning completely. So that was really cool because it actually worked.

And along with that, I did multiple washes on the fabric to see if the solution would wash out and make it less protective over time, and it didn't. So the fabric works. It's safe. And the design of the jacket tried to provide as much protection as possible. So the bell shape of it at the bottom allowed for young children to be able to crouch down, completely covering their feet.

And the hood covers basically up to and on their faces. So it's really just eyes and fingers that are exposed that can be tucked away into pockets and the hood pulled down. So ideally, probably about 95% protection when they're fully wrapped up in the jacket. I also really wanted to try and reduce the scariness of the jacket, because the environment that it's used in is terrifying.

So I put in lots of little colourful patches and sorts of things on the inside to make the jacket feel more personalised. There was also a little spot for a name tag that, again, made the child feel like they had a special input into the jacket. The development of it, and then being able to work with the VCAA and Melbourne Museum, has been really exciting for me because I feel as though I'm stepping into industry a little bit and being able to meet wonderful individuals who potentially could help this product be produced on the market.

So that's what I really felt was exciting out of this whole experience and opportunity, the idea that other designers would see it and it could inspire future students to work with similar fabrics or create solutions for similar problems. At the start of the year, the concept of Top Designs seemed like a bit of a pipe dream, but as the product developed and the year went on, I felt that there was more and more a possibility that Top Designs would be an option for me. And by the end of the year, my teacher was just so encouraging to apply for it. And so I did, and I'm here now. It was just really exciting.

So I'd have to thank my Design teacher, Sarah Grinzi. She was fantastic. She was so supportive and patient, helping me through all of the different processes that I was unfamiliar with, putting in hours both within the designated timetabled class but also hours extensively outside of class to help me. And she was just so fantastic. And also thanking the Australian Defence Apparel for supplying the fabric.

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