



**CALIFORNIA SCIENCE & ENGINEERING FAIR  
2018 PROJECT SUMMARY**

<b>Name(s)</b> <b>Diantha T. Ngo</b>	<b>Project Number</b> <b>S1013</b>
<b>Project Title</b> <b>A Biomedical Application to Smart Textiles</b>	
<b>Abstract</b> <b>Objectives/Goals</b> The objective of this project is to create a shirt that possesses the ability to monitor and display one's heart rate and body temperature. <b>Methods/Materials</b> Materials used were a t-shirt, electrically conductive thread, an LED light, a lithium ion battery, a pulse sensor, the LilyPad Simblee BLE, a lithium ion battery charger, and the LilyPad FTDI Basic Breakout. The LilyPad was programmed through the Arduino interface with a code that would collect heart rate, through a pulse sensor soldered to the LilyPad, and temperature, and display heart rate on an LED and temperature on a phone app. The LilyPad and LED were sewn onto the t-shirt using electrically conductive thread. <b>Results</b> I was able to successfully create a shirt that could track the heart rate and temperature of the wearer, meeting my original goal. <b>Conclusions/Discussion</b> This shirt is fully functional, simple to use, comfortable, easy to take on and off, and can potentially be marketed as a health and lifestyle product for everyday use, or has purpose in a hospital setting. The concept of smart textiles is versatile and highly useful and I wanted to use this project to showcase their various properties.	
<b>Summary Statement</b> My project is a shirt that possesses the ability to monitor and display the heart rate and temperature of the wearer.	
<b>Help Received</b> Received assistance from science teacher Mr. Jeff Adkins at Deer Valley High School in developing code for project; science project materials paid for by Deer Valley Ace Academy	