



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2018 PROJECT SUMMARY

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<b>Project Title</b> Reducing the Incidence of Scald Burns in Children Age Five and Under	
<b>Abstract</b> <b>Objectives/Goals</b> Problem: The leading cause of scald burns among children age five and under is due to a child pulling a pot or pan with hot contents in it off of a stovetop and the pan contents landing on the child.  Hypothesis: The incidence of scald burns among children age five and under can be reduced by creating a scald prevention device that prevents a child from being able to pull a pan off of a stovetop in a home kitchen, thus preventing hot contents in the pan from landing on the child. <b>Methods/Materials</b> To determine the pulling force that children exert that the scald prevention device would need to resist, the strength of 27 children age three to five was tested. The children pulled four times on a weight scale placed at the height where a pan handle would be on a standard stovetop. 13 configurations of scald prevention devices were created and tested for their ability to withstand a pulling force. The devices were tested at seven positions around a pan. The devices had four main components: 1) a cooktop anchor (magnets, suction cups, permanent clips), 2) a clip, 3) a tether, and 4) a clamp (connected to the pan). The pan was placed on a cooktop, a hook was attached to the end of the pan handle, and a bucket was attached to the hook. Weights were progressively placed into the bucket until the device failed (pan tilt angle of 25 degrees or pan came off cooktop). 52 trials were run, including base cases with no attached scald prevention devices. <b>Results</b> Seven of the scald prevention devices withstood the force of weights exceeding the maximum pulling strength of all the children tested (13 kg) when the scald prevention device was in position 4 (directly opposite the pan handle) or position 3/5 for two-anchor devices. 12 out of the 13 devices tested withstood the average pulling strength of each age group (3-year olds 5 kg, 4-year olds 6kg 5-year olds 9kg). The anchor and clamp positions significantly impact the results. <b>Conclusions/Discussion</b> Use of a properly positioned scald prevention device that anchors a pan to a cooktop and has sufficient weight resistance will reduce the incidence of scalding burns in children age five and under by preventing a child from being able to pull a pan off a cooktop.	
<b>Summary Statement</b> I created a device that will effectively reduce the incidence of scald burns among children age five and under.	
<b>Help Received</b> Numerous people provided guidance and insights regarding my project including: Jeremy Humphrey donated the stove I used in my testing, Matt Lopatka provided guidance regarding fail testing, my science teacher provided project guidance, and my father helped along the way.	