



# CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

<b>Name(s)</b>  <b>Emi Maeda</b>	<b>Project Number</b>  <b>J1718</b>
<b>Project Title</b>  <b>The Art of Skipping Stones: Favorable Angle and Shape of Stone</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives</b> Skipping stones is to throw stones in such a way that the stones bounce off the water several times. The objective of this experiment was to find the favorable angle and shape of stone for skipping stones.</p> <p><b>Methods</b> Rubber bands, can, tripod, and clay. After molding the clay into the same shape and size, make a device out of the rubber bands, can and tripod. Test near a body of water at the angle you wish to find. To test which shape of stone skips most, mold clay into different shapes and have a human throw them. Observe and record data.</p> <p><b>Results</b> After testing, upwards 20 degrees was the best angle when skipping stones with an average of 1.4 skips. Upwards and downwards 45 degrees had the worst outcome at no skips at all. The best shape of stone were flat circles 5 cm in diameter, this had a 3.4 average skip. The 3D shapes never seemed to skip more than once.</p> <p><b>Conclusions</b> For skipping stones, upward 20 degrees was the best angle because it is not too steep that is only penetrates through the water, but no too low that is does not have enough force to skip again. Circles skipped most because it does not have any corners and has enough surface area for skipping. Therefore, skips across the water more times. In final analysis, it is best to skip stones at 20 degrees upward with a circular shaped stone.</p>	
<b>Summary Statement</b>  The experiment found the angle and shape of stone that skips the most times.	
<b>Help Received</b>  I made the device and conducted the experiment myself. My science teacher, Mr. Espinoza gave me advice on the writing portion.	