



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Nicole E. Hamagami	Project Number J1615
Project Title When Waves Collide	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Problem Statement: A wave is produced when there is a disturbance in a flexible medium. What happens when two waves travel through the same point? Hypothesis: I predict that when two waves pass through a point, the resulting wave will increase in height.</p> <p>Methods/Materials Materials: Metal Spring (slinky), Ruler, Wire, Wood Board, 2 Hooks, 300 Pencils, Hot Glue Gun, Meter Stick, Water, Rectangular Tank, Food Coloring, 20 Quarters, Cellophane, Tape, Wooden Spoon (cooking spoon) Common Methods: I used a video camera because observing these wave collisions with the naked eye is almost impossible. I repeated each experiment ten times, recording measurements of single waves and interactions between two waves. Specific Methods: Compression Wave: 1) I stretched a spring one yard. 2) To create two waves, my helper and I compressed each end simultaneously. Transverse Wave: 1) I attached hooks to a wood board and stretched wire between the hooks. 2) I glued pencils to the wire. 3) I made a measuring board next to my wave creator. 4) To produce two waves, I tapped both ends of the wire. Common Water Methods: 1) I filled a tank with colored water for visibility. 2) I taped a ruler onto the tank. Specific Methods: Water Wave: 3) I pushed the tank three inches creating a single wave then pushed and pulled back the tank three inches to make the second. Circular Water Wave: 3) I set a wooden board on the tank. 5) I placed two wrapped stacks of ten quarters on 9 cm. marks and pushed them off with a wooden spoon.</p> <p>Results Results: Single compressional waves ranged from 2 to 6 cm. and averaged 3.75 cm. During the collision, the average was 4.38 cm. with a range of 2.5 to 7.5 cm., an increase of 16.8%. Transverse waves average deltas were 2.48cm with a range of 0.9 to 6.5 cm. Collision waves averaged 3.06 cm with a range of 1.8 to 4.2 cm., a 23.4% increase. Single water waves ranged from 0.4 to 1.7 cm. and averaged 1.02 cm. During the collision they ranged from 1.7 to 4.6 cm. averaging 2.65 cm., an increase of 159.8%. Circular water waves averaged 0.62 cm. with a range of 0.2 to 1 cm. During the collision, the average wave was 1.06 cm. with a range of 0.3 to 1.8 cm., an increase of 70.9%.</p> <p>Conclusions/Discussion Conclusion: When two waves are interacting, a larger wave is temporarily formed, diminishing as the</p>	
Summary Statement My project is about wave interactions, specifically measuring wave collisions.	
Help Received My step-father helped me build the wood framework that my apparatus was built on, helped with video recording, and tapped the spring.	