



**CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY**

Name(s) Stephen J. Chen	Project Number J1302
Project Title The Orientations of Dice	
Objectives/Goals My objective was to find out whether the orientation of a die would affect the outcome of the roll. I believed that it would in a positive manner; i.e. one number would come up significantly more than any other.	
Abstract	
Methods/Materials Methods 1. Assemble some LEGO pieces into the LEGO Dice-Dropper-Thing-A-Ma-Jig. 2. Place the d4 dice onto the "Dice Platform" of the Dice-Dropper-Thing-A-Ma-Jig with the value "1" facing up. 3. Pull the ratchet of the Dice-Dropper-Thing-A-Ma-Jig back to allow the "Dice Platform" to swivel down and drop the dice. 4. Level the "Dice Platform" of the Dice-Dropper-Thing-A-Ma-Jig to allow for next testing. 5. Record result in spreadsheet on computer. 6. Repeat steps 2-5 999 times. 7. Repeat steps 2-5 1000 times, but with the value "2" facing up. 8. Repeat steps 2-5 1000 times, but with the value "3" facing up. 9. Repeat steps 2-5 1000 times, but with the value "4" facing up. Materials: 1. One(1) LEGO Dice-Dropper-Thing-A-Ma-Jig[Made of various LEGOs]; 2. One(1) d4 dice [Four-Sided Dice]; 3. One(1) Computer; 4. One(1) Microsoft Excel Software; 5. Paper; 6. One(1) Printer.	
Results The orientation of a die does affect the outcome of the roll, but negatively; i.e. one number came up significantly less than any other. That one number was different for each of the four different orientations of the die which would remove doubts about it being a weighted die.	
Conclusions/Discussion Although the results did indicate influence with orientation of the die, it was not as I expected. I originally thought that the die would turn up a specific number more often than others. Instead, it happened in the inverse: A specific number turned up less often than others. So orientation dropping does help if you want to avoid a specific number, but it doesn't really help if you want the outcome to be a specific number. Also, I had tested only a d4 dice, which means most of my results don't apply to any other types of dice. Someone will have to take the time and do that themselves.	
Summary Statement Does the orientation of a die affect the outcome of the roll?	
Help Received Brother helped record results	