



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Philip M. Ramsdell	Project Number J1717
Project Title Spatter Proof: How Height and Angle Affect Blood Spatter Patterns	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of this project was to analyze two possible blood spatter pattern variables. Specifically, it was to determine if: a) the greater the height from which the blood is dropped the bigger the size of the spatter will be and b) the steeper the angle from which the blood is dropped the more of an ellipse shape spatter will result.</p> <p>Methods/Materials Materials: Fake Blood, Dropper (the kind with a bulb at the end), Meter Stick, Cardboard, White Paper, Protractor (or other means to measure angles) and Tacks or Pins. 1. Place five labeled pieces of paper on flat cardboard. 2. Measure the height you are dropping the fake blood from for the first set of trials (25cm). 3. Drop one drop onto each sheet of paper. 4. Repeat steps 1-3 for 50cm, 100cm and 150 cm heights. 5. Adjust cardboard at a 15-degree angle and prop securely in place. 6. Repeat steps 2-5 for 45-degree angle. The paper may have to be pinned into place.</p> <p>Results In the experiment there were 20 trials for each angle tested, and 15 trials for each height tested for a total of 60 trials. For the zero degree trials at all four heights the results showed nearly perfect spheres. What was most noticeable was the increase in size of the spatter's diameter as the height from which the blood was dropped increased. In the 15-degree trials, the spatter began to take on an elliptical shape as hypothesized although only slightly. Similar to the zero degree trials, as the height from which the blood was dropped increased, the diameter of the blood spatter also increased. In the 45-degree trials the main spatters were much more elongated. Full analysis includes discussion of secondary spatter and blood trails.</p> <p>Conclusions/Discussion The first hypothesis that the higher the blood is dropped from, the bigger the spatter it will create is correct. Since there is more time due to the greater height there is more impact from gravity pulling the drop down which makes the drop gather more speed so it hits the surface with more force. The second hypothesis that the steeper the angle, the more of an ellipse type of shape it will create is also correct. This is sort of like a landslide. The steeper the hill it is running on, the longer it will run.</p>	
Summary Statement This project is about how height and angle affect the shape and size of blood spatter patterns which are used for criminal and other investigations.	
Help Received Mr. Buss, the Science Fair Coordinator at my school as well as my parents provided general guidance. CVS Pharmacy donated some supplies. I performed the experiments on my own with some support from my mom.	