



**CALIFORNIA STATE SCIENCE FAIR  
2007 PROJECT SUMMARY**

<b>Name(s)</b> <b>Julie A. Ferguson</b>	<b>Project Number</b> <b>J0108</b>
<b>Project Title</b> <b>Fastest to Flow</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Determine how different shaped holes with the same area effect flow rate. I think overall, the water will flow through the circles the fastest because they have no sharp corners to slow the flow down. <b>Methods/Materials</b> A flow box was designed and constructed to test the flow rate through various shaped holes with different areas. Three different shapes were used; circles, squares and equilateral triangles, and each shape had four different areas. The shapes were cut into plastic caps which were fitted onto a pipe at the base of the flow box. The time required to flow an equal amount of water through each hole was recorded. <b>Results</b> The data proved the flow rate through the triangular shapes to be the fastest. In addition, the calculated velocity of the water flowing through each shape was nearly identical and independent of area for a given shape. However, the calculated velocity through the triangular shapes was higher than the other shapes, which confirms the flow rate through the triangle was the fastest. <b>Conclusions/Discussion</b> Through my experiments my hypothesis was proven wrong. Overall the triangle had the fastest flow rate. The velocity of the water through the holes was similar for each shape independent of the area of the opening. However, the velocity through the triangles was faster overall than either the circles or squares, because the triangles had the fastest flow rates. The flow pattern through the circle was circular, though the square had a pattern of two intersecting planes, and the flow through the triangles developed into a Y-pattern.	
<b>Summary Statement</b> Test how different shaped holes with the same area effect flow rate.	
<b>Help Received</b> Mom & Dad paid for all materials; Dad helped cut holes in caps with Xacto knife, with box assembly and testing; younger brother turned fill hose on and off.	