

Jordan Deslauriers & Bailey Kraich  
*The Bending of Paper through Geometric Frustration*

The purpose of this investigation is to relate the fold in a concentrically cut paper to the angle of the fold through mathematical means. We hypothesize that if the crease is made closer to the inner circumference of the paper, then the more dramatic the bend of the paper will be.

The experiment involves designing and cutting out the concentric figures. After the center of the figure is removed to create a disk then the paper was folded along the measured center line to create the bend. This procedure was repeated five times, with the center line being moved farther away from the inner circumference. After all the figures were designed the angle of the bend was recorded and graphed versus the distance of the center line's movement to help further the understanding of the relationship between the crease and the bend. After such data was recorded we made a mathematical equation to relate the data with the angles.

The data collected supports our original hypothesis. For every .4 cm that the crease was moved from the inner diameter, the angle changed by approximately .1047 radians. This constant change created a linear graph and equation that helped to find the torsion of the disks.

These findings lead us to believe that origami is not just a creative fold, but a distinct relationship between math and paper folding. Through our research we were able to further understand the importance of a distance versus angle relationship.