

1086-P5-1994 **Shelly Smith*** (smithshe@gvsu.edu). *Hands-on Calculus Using 3-D Paper Models*. Preliminary report.

Students often find it challenging to visualize 3-D objects when solving optimization applications or calculating volume in Calculus classes. In this talk, we describe an activity where students fold origami boxes of various sizes to gather data about the dimensions of the boxes to predict the height of the box with the maximum volume. The students then use the creases of the unfolded boxes to create a theoretical model for volume, and calculate the maximum of the function. This theoretical model can be extended to boxes folded from a square sheet of paper of any size. We also describe using tissue paper party decorations as models for calculating volume. Students use regression models to create a 2-D region that is rotated around the x-axis to create a solid of revolution. They divide the resulting 3-D object into appropriate sections and calculate the volume of each piece using disks or washers. These activities would also be appropriate for lab projects using a CAS. (Received September 24, 2012)