

Between The Folds: Applying Mathematics to Origami

Essential Questions

- How has paper folding evolved into much more than an art form?
- What is the relationship between surface area and volume?

Project Description

In the Origami Math project you will learn about the role of paper folding in mathematics through constructing a piece of modular origami. You will explore the relationship between surface area and volume. Is one always bigger than the other? Can you make cubes with the same surface area but different volumes?

Project Components

For each of the following options you will work in a team of two. Equal responsibility will be shared by both teammates for calculations and research. You will both need to research how to make the origami piece AND how to calculate the surface area and volume of each shape. Are you up for the challenge?

Modular Origami Piece: Within modular origami there exist many options in the different modules used and the different polyhedra constructed. The following are the two options that you may choose from. Keep in mind that there are multiple designs for each platonic solid.

- Cube: Regular platonic solid with six squares (calculations will include **surface area** and **volume**). Each student must make his/her own.
- Tetrahedron: Regular platonic solid with four triangles (calculations will include **surface area** and **volume**). Each student must make his/her own.

Extra Credit Option: Complete a one-page research paper where you explore other ways that origami is used in the real world. Must be written in your own words, typed in a google doc, and shared with Mr. Curtis or Ms. Villarreal. You will also need to present your findings to the class.

Project Deadlines

May

- Week of STAR Testing, Project Introduction
- Thursday, May 6th, “What are we building and how are we building it?”
- Wednesday, May 12th, Cardboard Prototype
- Tuesday, May 18th, Essay Outline (BOC)
- Wednesday, May 19th, Status Report #1
- Thursday, May 20th, Construction Begins
- Friday, May 21st, Essay 1st Draft (BOC)
- Tuesday, May 25th, Concept Poster 1st Draft (BOC)
- Wednesday, May 26th, DP Check in
- Thursday, May 27th, Essay 2nd Draft (BOC)
- Thursday, May 27th, Status Report #2 (BOC)
- Friday, May 28th, Parent/Adult Essay Critique (BOC)

June

- Wednesday, June 2nd, Concept Poster 2nd Draft (BOC)
- Friday, June 4th, Essay Final (BOC)
- Friday, June 4th, Instrument Built (EOC)
- Friday, June 4th, Concept Poster (EOC)
- Monday – Wednesday, June 1-3, Expert Panel Presentation
- Wednesday, June 9th, Digital Portfolio Completed (EOC)
- Thursday, June 10th, Exhibition Night 5:30-7:00