Folding the Future: An Innovative Approach to Solving the Supply Chain Crisis With Geometry

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Environmental damage is an ever-present issue for our generation, especially in the supply chain, which has suffered heavily since the beginning of 2020. Large amounts of packaging materials circulate throughout it every day, contributing to municipal waste in landfills and pollution. Eliminating wasted space in shipping containers by optimizing packaging volume and surface area will save precious environmental resources and lower material prices for shipping corporations. My research helped to achieve this goal. My experiment tested if a square piece of material and an adaptable computer algorithm could work together to solve packaging issues. I utilized origami box patterns to create shipping boxes that perfectly accommodate the dimensions of their products. My experimental procedures proved effective in testing each geometric shape, and all of my equipment worked efficiently throughout the project. Additionally, my hypothesis was supported by my results and conclusion. The square sheet of material, with the critical points tuned correctly and the adaptable computer program refined, proved to be the most innovative packaging solution. Possible alterations that would benefit the experiment would be a wider variety of packaging methods and materials. These would increase the project's viability and applicability to real-world scenarios. Further research on my topic includes refining my algorithm with more complex equations and engineering robots to fold my origami shipping boxes autonomously. Hopefully, as we continue to heal from the global pandemic, 'green' solutions like this will aid in our recovery and create a brighter world for future generations.

Awards Won:

Second Award of $2,000