

Single-use, multilayered packaging is a boon for the food industry, as it allows long shelf life and maintains the food's original flavors and freshness. This packaging, however, cannot be recycled and threatens the environment, creating an unsolved conundrum for the industry. In 2017, nearly 80 million tons of plastic packaging waste was produced, while less than 10% of it was recycled. Our innovative solution involves separating the packaging's individual layers so that each component can be "newcycled" in its original form to reduce the environmental impact of multilayered packaging. We tested different solvents to find an inexpensive, environmentally friendly solvent and optimized the processing conditions to achieve the best conditions for the recovery of the valuable components in their pure form. Throughout our project, we used the different aspects of STEM to increase our project's impact on our community. We used Science when we studied the properties of different solvents to narrow down to our top twelve solvents to be tested. Technology immensely sped up our project; not only did we use tools like Microsoft Excel and Minitab Software to analyze data quickly, but we also used an Ultrasonic Bath to catalyze the layer separation process. To ensure handling safety, we used Engineering to build a fume hood out of available materials. Mathematics was used to dilute solvents with the right amounts of water to achieve target concentrations. The result was a systematic study which could become the basis of a future cutting-edge newcycling plant.