Bags to Bridges: A Use For Polythene Plastic Bags

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Polythene plastic grocery bags made from petroleum by-products are everywhere. If these bags are not recycled, they pollute our environment. By recycling hundreds of these grocery bags, we created a building material, called PBR (plastic building resource), and then built a truss bridge scale model. Our hypothesis was the PBR bridge would hold more weight than the wooden one before collapsing. PBR was created, and then cut into sticks. Using these sticks, we built a small truss bridge. We also constructed a wooden truss bridge using the same measurements. Compression tests were conducted by adding increments of 20 lbs. to the upper bracings of each bridge. Furthermore, tension testing was carried out by placing weight upon the lower bracings where the road would be. This test confirms the actual amount of weight the bridges are able to hold. The bottom bracing of the PBR bridge was able to hold much more weight than the wooden bridge. The PBR Truss Bridge pieces did not snap, and sustained its integrity much better than the wooden counterpart. The PBR was also flexible, and not as rigid, which could be a desired feature for some building designs. While the wooden truss bridge surpassed the PBR Truss Bridge during the compression test, this definitely does not discount the PBR as a building material. This experiment showed that the PBR held much more weight than wood, and while it lacked in the compression test, it is important to remember this material could be better suited for use in suspension or beam bridge construction. Our experiment also demonstrated how recycled plastic grocery bags can be converted into a viable building material. In the future, PBR could be used to construct small structures or other building projects to further show PBR's usefulness.

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